香港申訴專員公署

Office of The Ombudsman, Hong Kong



主動調查報告

Direct Investigation Report

政府對電動私家車配套設施的規劃及安排

Government's Planning and Arrangements for Ancillary Facilities for Electric Private Vehicles

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Executive Summary
Direct Investigation Report

Government's Planning and Arrangements for Ancillary Facilities for Electric Private Vehicles

Introduction

In order to encourage the use of electric vehicles ("EVs") for reducing roadside air pollution, the Government has fully or partially waived the first registration tax ("FRT") for EVs since April 1994. The number of electric private vehicles ("EPVs") surged rapidly within a few years, but the growth in the number of public charging facilities has lagged far behind that of EPVs.

2. The focus of this investigation is not on whether the Government should promote the replacement of conventional petrol vehicles with EVs. We consider that the Government must set a clear policy and practicable measures (including planning, installation and development of ancillary facilities) with specific targets, so that various stakeholders (such as the two power companies, the automotive sector, vehicle owners and car park owners) would be motivated to offer their support in response.

Our Findings

3. Our investigation revealed inadequacies on the part of the Environment Bureau ("ENB") and Environmental Protection Department ("EPD") in the following seven aspects regarding the planning and arrangements for ancillary facilities for EPVs.

(I) Failing to Clearly Explain to the Public the Change in EV Policy

4. The Government started promoting the use of EVs as early as the 1990s and explicitly supported the implementation of such a policy in its policy documents. However, the Government has subsequently changed its policy and measures without clearly explaining to the public the reasons and justifications behind. As a result, the public cannot fully grasp the Government's stance in promoting the use of EVs.

5. Since 2016, the Government has undertaken to focus its policy on promoting the use of EVs in the public transport system, while the promotion of EPVs is no longer mentioned. In 2017, the Government reduced the FRT concession for EPVs. Meanwhile, the number of charging facilities in government public car parks has not shown any significant increase. Moreover, regarding the statement "the Government's longer term target is that as far as private cars are concerned, 30% are EVs or hybrid by 2020" in the Hong Kong Planning Standards and Guidelines ("HKPSG"), ENB explained that the figure merely represents a hypothetical scenario rather than an objective. The original "target" has been changed into a "vision". All those changes would inevitably give the public an impression that the Government is not as proactive in promoting the use of EPVs as before.

6. Promoting the use of EVs in Hong Kong is a long-term policy which requires clear and long-term planning. The Government, therefore, must clearly explain to the public its policy direction and specific targets, and its reasons and justifications for formulating the relevant measures (including the planning and arrangements for ancillary facilities). Where the Government finds it necessary to adjust the policy and modify the measures, it should also take the initiative to explain to the public the reasons in detail, and inform the parties affected of what can be done in the light of the change.

(II) Insufficient Charging Facilities

7. While the number of EPVs has surged since 2014, there has been no significant increase in the number of public charging facilities. It can be foreseen that EPV users will have greater difficulty than before in finding a public charger to charge their vehicles.

8. Regarding car parks managed by the Government, in the 24 hours public car parks under the Transport Department ("TD"), on average, 7.45% of the parking spaces have charging facilities. Furthermore, for the car parks under the Government Property Agency ("GPA"), which provide workplace parking spaces for some civil servants, on average only 15.79% of the parking spaces have charging facilities. As for the Hong Kong Housing Authority ("HKHA") and the Hong Kong Housing Society, which provide public and subsidised housing, the ratio of parking spaces equipped with charging facilities remains relatively low. Among the 161 car parks under HKHA, only 28 are equipped with charging facilities. Overall, the number of parking spaces equipped with charging facilities in government car parks remains relatively low. At present, the Government has not set any long-term or achievable targets for installation

of charging facilities in existing buildings.

9. In respect of promoting the installation of charging facilities in private buildings, the actions currently taken by the Government are merely issuing letters to encourage private building owners, and providing technical guidelines. In the lack of statutory requirements and financial incentives, and legal concerns regarding provisions under the land lease or deed of mutual covenant of the building often arise, existing private building owners are generally not so interested or determined in installing charging facilities. The Government has obviously underestimated the resistance to the installation of EV charging facilities at the car parks in private buildings. The Government needs to explore other means to encourage the installation of charging facilities in existing buildings.

10. As for new building developments, since 2011 the Government has granted gross floor area ("GFA") concessions to encourage developers to provide EV charging infrastructure for the private car parks of new building developments. Nevertheless, the Government makes no requirements for installing chargers and electricity meter connection at the parking spaces already provided with such infrastructure, nor has it any data on the specific charging facilities available at those venues and their charging speed.

(III) Underestimating the Demand for Charging Facilities

11. The Government sees no urgent need to increase the number of public charging spaces, because its statistics show that the current utilisation rate of charging facilities at public car parks is still relatively low. However, this can be due to the fact that charging spaces are often occupied by non-EVs. Besides, the charging spaces in some government public car parks are only equipped with standard chargers which require longer charging time, leading to slower turnover. The overall utilisation rate therefore becomes lower.

12. We believe that the current data on utilisation rate may not have fully reflected the actual demand for the charging facilities at public car parks, and the utilisation rate has been underestimated.

(IV) Information Sharing Inadequate

13. While information about public charging facilities is already uploaded to the EPD website, the Government does not have data on the utilisation of public charging facilities at non-government public car parks. This Office considers that collecting data on the utilisation of charging facilities will enable effective analysis and better estimation of the demand and supply for public charging facilities. The Government obviously lags behind in the application of information technology and in the setting up of information sharing platforms.

(V) Poor Management of Charging Spaces at Government Public Car Parks

14. Charging spaces at government car parks are frequently occupied by non-EVs or EVs that are already fully-charged. Although the Government claimed that charging spaces would be reserved for priority use by EVs during non-peak hours, the measure is not a statutory requirement and is implemented largely on a voluntary basis by the outsourced car park contractors. Lax monitoring also renders full and effective implementation impossible. Besides, many charging spaces are located near the entrances/exits of car parks and, therefore, readily taken up by non-EVs. We have also received comments from the public that some charging facilities at government car parks frequently broke down and were out of service.

15. Given the resources invested by the Government in installing more and better charging facilities, we consider it unsatisfactory, from the perspective of proper use of public resources, that the facilities could not be fully utilised because of poor management.

(VI) Failing to Formulate Clear Fee-charging Policy for Charging Service

16. Free charging service is the main incentive for people to buy EVs. At present, the Government is paying around $1 million a year in electricity bills of the charging facilities at its car parks. It already indicated that in the long run, it intends to charge a fee for public charging service. However, the Government has never announced when the free charging service will cease and the subsequent arrangements. In our view, no matter the charging service is provided free or not, and when it intends to start charging a fee, the Government should properly manage expectations and let the public know the related arrangements as soon as possible.

(VII) Lack of Other Long-term Support Measures

17. At present, EV owners mainly rely on the maintenance service provided by the original manufacturers. With the growing popularity of EVs, demand for EV maintenance service would become greater. We are of the view that the Government should urge the trade and training institutions to provide systematic training to EV mechanics and those who are interested in joining the profession. Furthermore, EVs as a category is not included under the Voluntary Registration Scheme for Vehicle Mechanics introduced by the Government. The relevant authorities should review the current guidelines and update the relevant codes of practice for the trade's reference.

18. Another important issue is the treatment for retired batteries for EVs, which normally have a lifespan of around seven years. With the growing popularity of EVs, the number of retired batteries is expected to soar. The Government now mainly relies on the EV manufacturers to recycle the batteries. No specific proposals or long-term planning for the disposal of retired batteries have been formulated.

Recommendations

19. In the light of the above, The Ombudsman makes 15 recommendations for improvement to **ENB** and **EPD**:

Policy Implementation

(1) to explain more to the public the reasons and justifications behind any adjustments to the measures and arrangements regarding the policy on the promotion of EVs;

(2) to review as soon as possible the contents relating to EV in the HKPSG, and make corresponding amendments and updates to match the Government's current policy direction and targets;

(3) to set an example by actively promoting the use of EVs among Government departments;

Ancillary Charging Facilities

(4) to consider installing more charging facilities at car parks managed by Government departments and public organisations (such as HKHA/ Hong Kong Housing Society/ GPA) in order to support the Government's current policy of encouraging EV owners to charge up their vehicles at their homes and workplaces;

(5) to coordinate and assist other Government departments and public organisations in enhancing the efficiency of charging facilities;

(6) to install more charging facilities at government public car parks;

(7) to collect data on the utilisation of public charging facilities at non-government car parks for assessing the need for and scale of expansion of public charging facilities;

(8) to discuss with TD and GPA, the departments that manage government public car parks, ways to improve the management of charging spaces. This should include a review on how to enhance the current measure of "priority use of charging spaces by EVs" and arrangements for setting up new charging facilities at locations further away from the entrances/exits and passageways of car parks;

(9) to expedite the setting up of a smart system for the public EV charging network;

(10) to formulate a clear fee-charging policy and announce the arrangements as soon as possible;

Support Measures

(11) to strengthen liaison with owners' corporations and owners' committees of private buildings, and explore other means to encourage existing buildings to install charging facilities;

(12) to review the arrangements for granting GFA concessions to the car parks of newly constructed buildings, and to update the Technical

Guidelines for Electric Vehicle Charging-enabling for Car Parks of New Building Developments;

(13) to collect data on the charging facilities in newly constructed buildings and the charging speed of the facilities;

Long-term Planning

(14) to urge related institutions to step up training for EV mechanics and repair technicians for charging facilities, as well as review the current guidelines and update the relevant codes of practice; and

(15) to discuss with the trade and EV suppliers issues relating to the recycling and disposal of retired EV batteries.

Office of The Ombudsman
October 2019

1

INTRODUCTION

BACKGROUND

1.1 Since April 1994, the Government has fully or partially waived the first registration tax ("FRT") for electric vehicles ("EVs") to encourage the use of EVs with the aim of reducing roadside air pollution. In April 2009, the Steering Committee on the Promotion of Electric Vehicles ("the Steering Committee") headed by the Financial Secretary was set up to recommend a strategy with specific measures to promote the use of EVs.

1.2 The 2009/10 Policy Address clearly stated that it was the Government's policy objective to make Hong Kong one of the cities where EVs would be most widely used. Moreover, the 2009/10 Budget indicated that the Government would study the feasibility of providing charging facilities in government multi-storey car parks and explore ways of encouraging the business sector to provide similar facilities. In May 2011, the Government revised the Hong Kong Planning Standards and Guidelines ("HKPSG"), setting out its longer term target to be: 30% of private vehicles are EVs or hybrids by 2020, while recommending that 30% of the private vehicle parking spaces in new building developments (i.e. those mentioned in paragraph 7.2.8 of Chapter 8 "Internal Transport Facilities" in the HKPSG) should be equipped with charging facilities.

1.3 Given the Government's encouragement, the number of electric private vehicles ("EPVs") in Hong Kong surged 58 times within a few years, from 178 registered EPVs at the end of 2011 to 10,588 in April 2017. Nevertheless, the growth in the number of public charging facilities has lagged far behind that of EPVs. According to statistics provided by the Environmental Protection Department ("EPD"),

there was merely an increase of 3.8 times in the number of public charging facilities[1] from 372 at the end of 2011 to 1,774 in September 2017.

1.4 Since the Government has explicitly supported the use of EVs in its policy documents, it is reasonable for the public to expect that the Government will plan and arrange for more ancillary facilities. Members of the public may purchase EPVs in response to the Government's policy or in order to benefit from the concessionary measures. Nevertheless, the number of public EV charging facilities has subsequently failed to keep pace with the rapid growth of EPVs. It has not only caused inconvenience to EPV owners, but also impeded the Government's policy on promoting the use of EVs.

1.5 In this light, The Ombudsman declared a direct investigation pursuant to The Ombudsman Ordinance (Cap. 397) on 28 September 2017 to examine whether the Government has adopted appropriate measures in planning and arranging for ancillary facilities in support of its policy on promoting the use of EVs.

SCOPE OF INVESTIGATION

1.6 The Environment Bureau ("ENB") and EPD are the leading authorities responsible for the policy on promoting the use of EVs. Hence, they are the targets of this direct investigation. The scope of investigation covers:

- details of the Government's policy on promoting the use of EVs;
- the Government's planning and arrangements for ancillary facilities for EPVs; and
- any areas for improvement and enhancement.

PROCESS OF INVESTIGATION

1.7 In this direct investigation, this Office has:

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[1] These include charging facilities at government and private car parks, and those provided by power companies, charging facilities providers, EV suppliers and various other organisations.

- invited views from members of the public;

- examined relevant policy documents relating to the Government's promotion of the use of EVs and provision of ancillary charging facilities, including the Policy Addresses, Budgets, Government press statements, minutes of meetings of the Steering Committee, and the minutes and discussion papers at meetings of the Panel on Environmental Affairs of the Legislative Council ("LegCo");

- scrutinised the information and statistics provided by ENB and EPD on the Government's policy measures and long- and short-term objectives on EVs;

- examined how other related Government departments/public organisations assisted in and executed the Government policy on promoting the use of EVs. They included the Transport Department ("TD"), Government Property Agency ("GPA"), Government Logistics Department ("GLD"), Hong Kong Housing Authority ("HKHA") (with the Housing Department ("HD") as its executive arm), Hong Kong Housing Society ("HKHS") and Leisure and Cultural Services Department ("LCSD");

- consulted the two power companies, namely CLP Power Hong Kong Limited ("CLP") and Hong Kong Electric Company Limited ("HK Electric"), as well as the Hong Kong Productivity Council ("HKPC") on EVs and ancillary charging facilities; and

- conducted site observations to check the utilisation of charging facilities at four public car parks under the Government, including the Rumsey Street Car Park, Star Ferry Car Park, Cheung Sha Wan Government Offices Car Park and Tsuen Wan Car Park.

1.8 On 25 July 2019, we issued the draft investigation report to ENB/EPD, other related Government departments and HKHS for comments. This final report, incorporating the comments from them, was completed on 17 October 2019. The full report has been uploaded to this Office's website (www.ombudsman.hk).

2

GOVERNMENT POLICY AND MEASURES ON PROMOTING THE USE OF ELECTRIC VEHICLES

BACKGROUND

2.1 EVs have no tailpipe emissions and are efficient in converting energy from the grid to power at the wheels. Hence, replacing conventional vehicles with EVs can help improve roadside air quality and reduce greenhouse gas emissions. The Government started promoting the use of EVs as early as in the 1990s and set up the Steering Committee (see **para. 1.1**) in 2009. With members coming from different sectors, the Steering Committee makes recommendations on strategies and specific measures to facilitate promotion of the use of EVs.

ROLES AND DUTIES OF RELEVANT POLICY BUREAU AND DEPARTMENTS IN PROMOTING THE USE OF ELECTRIC VEHICLES

2.2 Duties of **ENB/EPD** include:

(1) planning and coordinating the formulation of policy on promotion of use of EVs;

(2) working with relevant departments to explore feasible measures for implementing proposals of installing charging facilities in new buildings;

(3) coordinating and implementing measures to promote the use of EVs, which include: managing the Pilot Green Transport Fund ("PGTF") (see **para. 2.15(2)** for details); providing assistance to franchised bus companies in purchasing electric buses and running pilot schemes; providing information and technical support to organisations or individuals intending to install charging facilities for EVs; installing charging facilities for EVs at government car parks; and working with the business sector to increase and enhance public charging facilities for EVs; and

(4) establishing policy to give priority to EVs to use parking spaces equipped with charging facilities at government car parks during non-peak hours.

2.3 The **Electrical and Mechanical Services Department** ("EMSD") provides necessary technical support to EPD on installation of charging facilities for EVs.

2.4 **TD** and **GPA** assist EPD in implementing the measures to promote the use of EVs as regards areas that fall within their duties, which include requiring operators of government car parks under TD and GPA to give priority to EVs to use those parking spaces equipped with charging facilities during non-peak hours and where feasible.

2.5 **TD, GPA, HD,** the **Highways Department** and **LCSD** assist ENB/EPD in the implementation of the relevant Government policy and measures, including the installation of charging facilities for EVs at their car parks where feasible.

2.6 **GLD** opts for environment-friendly vehicles[2] when arranging replacements for government vehicles to match ENB's policy.

2 Including EVs, hybrid vehicles, liquefied petroleum gas light buses and vehicles that meet the standards established under the scheme of the Tax Incentives for Environment-friendly Commercial Vehicles.

GOVERNMENT POLICY AND MEASURES ON PROMOTING THE USE OF ELECTRIC VEHICLES

2.7 Based on the information provided by EPD, Government's Policy Addresses, Budgets and press statements, relevant policy documents and the Steering Committee's minutes of meetings, it was in the 1980s that the Government started offering concessionary rates in the annual licence fee for EVs[3]. Since 1994, the Government has introduced the following policies and measures for promoting the use of EVs (including private and commercial vehicles).

1994:
Waiving for the First Time the FRT for EVs

2.8 To combat the problem of air pollution caused by petrol vehicles, the Government hoped to encourage members of the public to choose EVs without tailpipe emissions. However, at that time, EV technologies were still at the early stage of development, mass production and supply of EVs in the market was essentially non-existent and EVs were, therefore, more expensive than petrol vehicles. Consequently, the Government waived the FRT for EVs since April 1994 and extended the measure several times afterwards so as to lower the cost borne by all sectors in trying out EVs and support the development of EV technologies.

2002:
Encouraging the Use of Alternative Fuel Light Buses (Including Electric Light Buses)

2.9 EPD conducted a pilot scheme in 2000 to find out whether liquefied petroleum gas ("LPG") light buses and electric light buses are suitable for commercial operation in Hong Kong. In 2002, TD launched a subsidy scheme to provide a lump sum subsidy to eligible owners of diesel public light buses in order to encourage them to replace their light buses with electric or LPG light buses.

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3 As early as in the 1980s, the Government had charged a lower annual licence fee for EVs than for conventional vehicles in accordance with the Road Traffic (Registration and Licensing of Vehicles Regulations) (Cap 374E). While the annual vehicle licence fee for EPVs is calculated based on their unladen weight, conventional private vehicles are charged annually according to their engine capacity. Currently, the annual licence fees for EPVs range from $600 to $1,100 and those for conventional private vehicles range from $3,815 to $12,675.

2009:
Promoting the Use of EVs as a Significant Component of "Green Economy"

2.10 Despite the advent of mass-produced EPVs in the market since late 2000s, use of EVs was still limited because there were still huge gaps in driving range and efficiency between EVs and conventional petrol private vehicles, and EV technology in general were yet to mature. Nevertheless, the Government considered preparations necessary as development of EV technology might accelerate in the future.

2.11 In the 2009/10 Policy Address, the Government proposed to implement two measures to promote the use of EVs. Those measures, including the introduction of EVs into the local market and government collaboration with the two power companies to launch an EV leasing scheme, aimed at making Hong Kong the second region in Asia, after Japan, where EVs are most widely used. The Budget that year also made an express statement that the Government would actively promote the use of EVs. Since charging facilities are crucial for the wide use of EVs in Hong Kong, **the policy direction was, therefore, to promote the installation of EV charging facilities**.

2.12 In that year, related measures introduced by the Government included:

(1) setting up a Steering Committee led by the Financial Secretary (see **paras. 1.1 and 2.1**) to make recommendations on the strategies and specific measures for promoting EVs;

(2) extending the wavier of FRT for EVs (see **para. 2.8**);

(3) Government taking the lead in using EVs and starting to procure during the year;

(4) studying the feasibility of installing charging facilities at government multi-storey car parks; and

(5) consulting and negotiating with EV manufacturers and encouraging them to introduce different types and models of EV into the Hong Kong market.

2010 to 2011:
Expanding the Charging Network, Encouraging the Transport Sector to Try out EVs

2.13 The Government's policy direction is to actively promote the use of EVs. In May 2011, Chapter 8 of the HKPSG[4] on "Internal Transport Facilities" was revised, adding in the guidelines for "Electric Vehicle Charging Facilities". The original text of the relevant paragraphs (7.2.7 to 7.2.11) reads:

> *7.2.7* ***Government has been actively promoting the wider use of electric vehicles (EVs) in Hong Kong, with a view to improving road side air quality, reducing greenhouse gas emissions and creating green business opportunities.*** *As EVs are driven by electric power, they need regular charging to stay in operation. At present, most EVs can be charged by standard charging facilities (i.e. home electric sockets with 220V, 13A power sources). The setting up of standard charging facilities at car parks basically involves electrical wiring and installation of socket outlets;*
>
> *7.2.8* *The provision of sufficient charging facilities in both private and public parking is crucial to the adoption and use of EVs.* ***The Government's longer term target is that as far as private cars are concerned, 30% are EVs or hybrid by 2020.*** *On the assumption that the ratio of electric private cars to charging points should be at least one to one, EV standard charging facilities should be provided, where appropriate, in at least 30% of car parking spaces for private car in the following types or a mix of the following types of new developments –*
>
> *(a)* *car parks of residential developments;*
>
> *(b)* *car parks of commercial facilities;*
>
> *(c)* *car parks of industrial developments; and*
>
> *(d)* *car parks of business developments.*

4 The HKPSG is formulated and revised by the Planning Standards Sub-Committee under the Committee on Planning and Land Development. It is a Government manual of criteria for determining the scale, location and site requirements of various land uses and facilities. This manual is applied in planning studies, preparation/revision of town plans and development control.

7.2.9 *To cater for future increase in the number of EVs, all car parking spaces of new developments as outlined in para. 7.2.8 (a) to (d) should be EV charging enabling, the technical requirements of which are specified in the relevant technical guidelines issued by the Electrical and Mechanical Services Department.*

7.2.10 *Requirements in para. 7.2.8 - 7.2.9 do not apply to on-street parking spaces or outdoor car parks (with or without shelter).*

7.2.11 *The installation of charging facilities and electrical wiring works should be done in compliance with relevant legislations (i.e. the Electricity Ordinance (Cap. 406) and regulations made thereunder) and guidelines issued by the Environment Bureau and the Electrical and Mechanical Services Department from time to time.*

2.14 Meanwhile, the Government clearly stated that it would push forward the expansion of the EV charging network across the territory. The relevant measures included:

(1) to increase the number of charging facilities at government car parks and encourage the two power companies as well as public and private organisations in different sectors to provide public charging facilities at the car parks under their management;

(2) to issue technical guidelines and guidelines on arrangements for installing EV charging facilities, and set up a hotline to provide information and technical support for those intending to install such facilities;

(3) to send letters to more than 7,400 owners' corporations and owners' committees across the territory, appealing for their active response to the demand of EV users for installing EV charging facilities in the properties under their management;

(4) to revise Chapter 8 of the HKPSG to add in the standards for EV charging facilities, including the recommendation that 30% of the private vehicle parking spaces in new building developments should be

equipped with standard EV charging facilities (see **para. 2.13**). In 2011, the Architectural Services Department ("ArchSD") also updated the relevant design guidelines which suggested to have, where suitable, not less than 30% of the private car parking spaces in newly constructed government buildings equipped with standard EV charging facilities; and

(5) to tighten the gross floor area ("GFA") concessions granted to the car parks of newly constructed buildings, thereby encouraging property developers to provide infrastructure for charging facilities at the car parks in those buildings (which includes adequate power supply, cables and ducts) that enables the installation of charging facilities in the future to meet the needs of car park users. Instead of all car parks specified on approved plans being granted exemptions from GFA calculations as in the past, under the tightened scheme, only underground car parks provided with infrastructure for EV charging facilities at each parking space could be fully exempted.

2.15 Apart from encouraging more individual motorists to choose EVs, the Government also encouraged the transport sector (including public transport operators) to try out low-pollution and low-carbon green vehicles, such as EVs. The relevant measures included:

(1) the 2010/11 Budget proposed to offer tax concession to encourage commercial organisations to purchase EVs. They could enjoy a 100 percent profits tax deduction for capital expenditure in the first year of purchasing EVs and other eligible environment-friendly vehicles; and

(2) the 2010/11 Budget proposed to set up the PGTF to subsidise the public transport industry, the goods vehicles operators and non-profit making organisations to try out innovative green and low-carbon transport technologies (including electric commercial vehicles ("ECVs") and related charging facilities).

2012 to 2015:
"Infrastructure-led" Enhancement of the Public Charging Network

2.16 Since 2014, there have been more EPVs available in Hong Kong with more mature technology and longer driving range. The price difference between EPVs and conventional petrol private vehicles also narrowed, while choices of EPV models widened. All these brought an exponential growth in the number of EPVs. The Government continued to implement the aforementioned measures to promote the use of EVs, and took initiatives to push forward the enhancement of the public charging network. The initiatives included:

(1) the Government continued to take the lead in using more EVs and provide subsidy to the public transport operators to try out EVs (e.g. providing full subsidy to the franchised bus companies to purchase 36 single-deck electric buses and related charging facilities for trial on a number of routes), with a view to achieving wider use of green transport;

(2) installing more medium charging facilities at government car parks to improve the charging speed of EVs (according to information from EPD, as at August 2014, there were around 1,000 public EV chargers (including government-owned and non-government-owned) across the territory, mostly standard charging facilities; in 2014/15, 100 standard chargers at government car parks were replaced by dual-mode chargers with standard and medium charging functions; compared with standard chargers, medium chargers can reduce charging time by around 60%);

(3) commencing tests of medium charging piles at outdoor car parks;

(4) encouraging private property developers and property management companies to install more EV charging facilities; and

(5) introducing a pilot scheme, under which electric taxi suppliers are allowed to install quick charging facilities at car parks under TD, thereby promoting the development of electric taxis.

2016 and after:
Focusing on Promoting the Use of EVs in Public Transport

2.17 Since 2016, the Government has indicated that it would promote the use of EVs to improve roadside air quality and reduce greenhouse gas emissions. According to the 2016 Policy Address, the Government undertook to focus on promoting the use of EVs in the public transport system. In the Policy Agenda of the 2017 Policy Address, it was mentioned that the Government would try out electric franchised buses and continue to enhance the charging network for EVs.

2.18 In February 2017, ENB announced that in the 2017/18 financial year the FRT concession for EPVs would be reduced from full exemption to a cap at $97,500[5]. At that time, ENB indicated that commercial vehicles are the major source of roadside air pollution in Hong Kong. The Government, therefore, has all along made commercial vehicles the major target in its measures for reducing vehicular emissions (such as encouraging the replacement of conventional petrol vehicles with EVs). Hence, the FRT for ECVs would continue be waived in full to encourage purchase of such vehicles and promote their development.

2.19 Apart from continuing with existing measures (see **para. 2.15** and **note 5(ii)**) for promoting ECVs, in the 2018 Policy Address, the Government announced that it would review the PGTF with a view to facilitating the transport sector's wider use of green transport technologies, including ECVs.

2.20 As regards private vehicles, the Government has adopted a public transport-oriented policy with railway as the backbone, which encourages people to use public transport. Meanwhile, members of the public who need to purchase private vehicles are encouraged to choose EVs.

2.21 Since 1 April 2017, the Government has reduced the FRT concession for EPVs from full exemption to a cap at $97,500 (see **note 5(i)**). Subsequently, on 28 February 2018, the Government introduced the "One-for-one Replacement" Scheme in addition to extension of the existing FRT concession (capped at $97,500) to encourage vehicle owners to choose EVs when they need a replacement. Existing vehicle owner

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5 On 22 February 2017, ENB announced details of FRT concessions for EVs for the period from 1 April 2017 to 31 March 2018 as follows:
(i) the FRT of EPVs will be waived up to $97,500; and
(ii) the FRT of ECVs (including goods vehicles, buses, light buses, taxis, and special purpose vehicles), electric motorcycles and electric motor tricycles will be waived in full.

who purchases a new EPV and then arrange to scrap and de-register his old eligible private vehicle (either a private vehicle with internal combustion engine or EPV) is allowed a higher FRT concession up to $250,000. The concession arrangement will remain valid until 31 March 2021. On 28 January 2019, the Government announced the relaxation of two eligibility criteria under the "One-for-one Replacement" Scheme[6], while the FRT concession remains unchanged at $250,000.

2.22 Regarding charging facilities, in February 2018, EPD completed the upgrade of standard chargers to medium chargers, which can reduce the charging time by around 60%, at public car parks under TD and GPA. Except for those chargers located at TD car parks already scheduled for demolition, and those chargers with both standard and medium charging functions, all standard chargers at public car parks under TD and GPA have been upgraded to medium chargers. The Government will also facilitate the installation of more charging facilities in private buildings.

2.23 Meanwhile, the Government considers that EPV owners should perform daily vehicle charging at home, workplace or other suitable places (including designated charging points provided by vehicle dealers). Public charging facilities are supplementary in nature, set up merely to meet the occasional needs of EVs to replenish the charge for completing their journeys. EPV owners should not rely on public charging facilities for their daily charging needs.

2.24 Given the aforementioned policy, the Government will carry on with existing measures (see **para. 2.14**) and step up publicity and public education, thereby encouraging the installation of charging facilities at private car parks in new and existing buildings.

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6 The relevant criteria were revised as follows:

(i) Ownership period: The private vehicle owner must have been the registered owner of the old private vehicle for 18 months or more, instead of three years or more, without interruption, immediately prior to its de-registration; and

(ii) Licensed period: The old private vehicle, with or without interruption, must have been licensed for at least 10 months (i.e. 304 days or more) within the 12 months immediately before its de-registration, instead of at least 20 months (i.e. 608 days or more) within the 24 months immediately before its de-registration.

Except for the above two criteria, all other eligibility criteria and application procedures under the Scheme remain unchanged.

GOVERNMENT MEASURES TO PROMOTE THE USE OF ELECTRIC PRIVATE VEHICLES

2.25 In sum, the Government has introduced the following measures in promoting the use of EPVs:

Financial Incentives

(1) FRT concessions are offered for EPVs:

- From 1 April 1994 to 31 March 2017: full exemption;

- From 1 April 2017 to 31 March 2021: capped at $97,500; and from 28 February 2018 to 31 March 2021: existing vehicle owners who purchase a new EPV and scrap their old eligible private vehicles are entitled to a higher FRT concession up to $250,000 under the "One-for-one Replacement" Scheme (see **para. 2.21**);

(2) Corporate purchases of environment-friendly vehicles (including EVs) are allowed a full deduction of capital expenditure in the assessment of profits tax in the first year of the purchases;

(3) EPVs can enjoy a lower annual vehicle licence fee (see **para**. **2.7**);

(4) Free public charging facilities are available at government car parks under TD and GPA, and users do not need to pay for charging services;

Contacts with EV Suppliers

(5) On vehicle supply, the Government maintains close contacts with EV manufacturers worldwide and encourages them to introduce different types and models of EV the local market;

Provision of Charging Facilities and Technical Support

(6) A dedicated team and a service hotline have been set up to provide information and technical support for parties intending to install EV charging facilities. Guidelines have been issued on the arrangements and technical requirements for setting up charging facilities;

(7) Chargers are available at government car parks that are open to public use, and their efficiency will be steadily enhanced;

(8) At the indoor car parks of newly developed government buildings, not less than 30% of parking spaces will be equipped with EV charging facilities, including medium chargers, while the remaining parking spaces will be equipped to enable installation of EV charging facilities in future;

(9) To cooperate with the commercial sector to increase and upgrade the public charging facilities for EVs, including encouraging the power companies and public and private organisations in various sectors to install more public charging facilities at their existing car parks;

(10) By granting GFA concessions to car parks, developers are encouraged to provide basic EV charging-enabling infrastructure, including sufficient power supply capacity, cabling and conduits at the car parks of new building developments, such that charging facilities can be installed in future to meet the needs of car park users;

(11) The HKPSG has been revised to incorporate the standards on EV charging facilities, including the recommendation that 30% of the private vehicle parking spaces of new building developments should be equipped with standard charging facilities for EVs;

(12) By such means as letters and workshops, appealing to owners' corporations and owners' committees for actively responding to requests of EV users and allowing installation of EV charging facilities on their premises; and

Government Procurement

(13) The Government will take the lead in using EVs and continue to procure EVs to replace vehicles due to retire, subject to the operational needs of the departments and other factors (such as the maturity of relevant EV technologies, sufficiency of choices and competition in the market, and availability of resources).

3

RELEVANT STATISTICAL DATA

NUMBER OF ELECTRIC PRIVATE VEHICLES

3.1 The number of registered EPVs (excluding government vehicles) in Hong Kong and its percentage over the total number of registered private vehicles since 2008 are listed in **Table 1**.

Table 1: Number of registered EPVs in Hong Kong[7]

Year (as at the end of the year)	Number of registered EPVs	Percentage over the total number of registered private vehicles
2008	4	0.001%
2009	4	0.001%
2010	60	0.013%
2011	178	0.038%
2012	285	0.058%
2013	317	0.061%
2014	1,160	0.214%
2015	3,806	0.670%

7 Figures from TD's Monthly Traffic and Transport Digest statistics on registration and licensing of vehicles by fuel type.

Year (as at the end of the year)	Number of registered EPVs	Percentage over the total number of registered private vehicles
2016	6,829	1.171%
2017	10,666	1.776%
2018	11,080	1.794%

NUMBER OF PUBLIC CHARGING FACILITIES AND THEIR UTILISATION

3.2 Starting from 2011, ENB has compiled statistics on the number of public charging facilities for EVs each year. The statistics are listed in **Table 2**.

Table 2: Number of public charging facilities (including those at government and non-government car parks)

Year	Number of public charging facilities for EVs	Number of registered EPVs (Table 1)	Ratio of public charging facilities to number of registered EPVs
2011	372	178	1 : 0.48
2012	1,004	285	1 : 0.28
2013	1,036	317	1 : 0.31
2014	1,125	1,160	1 : 1.03
2015	1,221	3,806	1 : 3.12
2016	1,518	6,829	1 : 4.50
2017	1,862	10,666	1 : 5.73
2018	2,166	11,080	1 : 5.12

3.3 Since 2012, EPD has installed public charging facilities for EVs at some of the government car parks (managed by TD or GPA). Those charging facilities are managed and maintained by EPD. The number of charging facilities installed at

government car parks managed by TD and GPA between 2011 and 2018 are listed in **Table 3**. The number of public charging facilities installed at car parks managed by LCSD, HKHA and HKHS are listed in **Table 4**.

Table 3: Number of charging facilities (including government and non-government facilities) installed at public car parks managed by TD and GPA (categorised according to the speed of charging facilities)

Year	Number of charging facilities for EVs at government car parks					
	Car parks	Standard	Medium*	Quick	Subtotal	Total
2011	GPA	0	0	0	0	**0**
	TD	0	0	0	0	
2012	GPA	150	0	0	150	**507**
	TD	356	0	1	357	
2013	GPA	150	0	0	150	**507**
	TD	356	0	1	357	
2014	GPA	102	48	0	150	**467**
	TD^	264	52	1	317	
2015	GPA	102	48	0	150	**471**
	TD	264	52	5	321	
2016	GPA	102	48	0	150	**471**
	TD	264	52	5	321	
2017	GPA	78	72	0	150	**436**
	TD#	79	202	5	286	
2018	GPA	0	150	0	150	**436**
	TD+	61	220	5	286	

* Including medium chargers as well as dual-mode chargers which can run on both standard and medium speed (counted only as medium chargers).
In 2018, GPA had a total of 48 dual-mode (standard + medium) chargers.
In 2018, TD had a total of 52 dual-mode (standard + medium) chargers.

^ The number of charging facilities was reduced by 40 since the Middle Road Car Park ceased operation on 1 July 2014.
The number of charging facilities was reduced by 35 since the Murray Road Car Park ceased operation on 1 May 2017.
+ As the Star Ferry Car Park and Yau Ma Tei Car Park are scheduled to be demolished, the existing 61 standard chargers installed at these two car parks will not be upgraded to medium chargers.

Table 4: Number of public charging facilities installed at car parks managed by LCSD, HKHA and HKHS (categorised according to the speed of charging facilities)

Number of public charging facilities for EVs at car parks managed by LCSD, HKHA and HKHS (as at December 2018)				
Car park	**Standard**	**Medium**	**Quick**	**Total**
LCSD	11	7	0	**18**
HKHA*	576	21	8	**605**
HKHS^	60	34	1	**95**
Total (percentage over the total number of charging facilities)	**647 (90.1%)**	**62 (8.6%)**	**9 (1.3%)**	**718**

* Standard charging facilities are mainly installed at monthly rented parking spaces.
^ There are three charging facilities that provide two or three modes of speed.

3.4 The distribution of charging facilities at government car parks and their average utilisation in the past three years are listed respectively in **Table 5** and **Table 6**.

Table 5: Distribution of charging facilities (including government and non-government facilities) at government public car parks

	Car park	Number of charging facilities as at December 2018			
		Standard	Medium*	Quick	Total
Hong Kong Island (Total number of charging facilities: 246)					
1	Star Ferry Car Park#@	27	11	1	39
2	City Hall Car Park#	0	30	0	30
3	Rumsey Street Car Park#□	0	35	2	37
4	Tin Hau Car Park#	0	38	0	38
5	Shau Kei Wan Car Park#□	0	35	2	37
6	Queensway Government Offices^	0	20	0	20
7	Wanchai Tower, Immigration Tower and Revenue Tower^	0	30	0	30
8	North Point Government Offices^	0	15	0	15
Kowloon (Total number of charging facilities: 105)					
9	Yau Ma Tei Car Park#@	34	6	0	40
10	Sheung Fung Street Car Park, Wong Tai Sin#	0	35	0	35
11	Cheung Sha Wan Government Offices#	0	30	0	30
New Territories (Total number of charging facilities: 85)					
12	Tsuen Wan Car Park#	0	30	0	30
13	Sai Kung Government Offices^	0	20	0	20
14	Sha Tin Government Offices^	0	20	0	20
15	North District Government Offices^	0	15	0	15
	Total	**61**	**370**	**5**	**436**

Managed by GPA **Managed by TD**

* The figures include purely medium chargers as well as dual-mode chargers which can run on both standard and medium speed (but counted only as medium chargers).
In 2018, GPA had a total of 48 dual-mode (standard + medium) chargers.
In 2018, TD had a total of 52 dual-mode (standard + medium) chargers.

Open to public use round-the-clock.
^ Open to public use only outside office hours (i.e. in general 7 pm to 7 am on Mondays to Fridays; 24 hours on Saturdays, Sundays and public holidays).
□ At both the Rumsey Street Car Park and the Shau Kei Wan Car Park, there are two parking spaces simultaneously equipped with a quick charger provided by an EV manufacturer and an EPD charger.
@ Car parks scheduled for demolition.

Table 6: Utilisation of EV charging facilities at government public car parks

	Car park	Average times of use per month of each charging facility[Note]		
		2016	2017	2018
1	Star Ferry Car Park	22	22	20
2	City Hall Car Park	15	42	47
3	Rumsey Street Car Park	17	25	23
4	Tin Hau Car Park	19	27	24
5	Shau Kei Wan Car Park	15	21	21
6	Queensway Government Offices	1	1	2
7	Wanchai Tower, Immigration Tower, and Revenue Tower	3	5	6
8	North Point Government Offices	10	9	7
9	Yau Ma Tei Car Park	26	32	36
10	Sheung Fung Street Car Park, Wong Tai Sin	3	12	9
11	Cheung Sha Wan Government Offices	13	12	9
12	Tsuen Wan Car Park	12	19	16
13	Sai Kung Government Offices	3	5	5
14	Sha Tin Government Offices	5	5	5
15	North District Government Offices	3	9	10
	Average	**11**	**16**	**16**

Note
1. The average times of use per month of the charging facilities (including standard, medium and dual-mode (standard + medium) chargers) are estimated based on the combined monthly electricity consumption of all the government charging facilities at the above car parks.
2. The Government is developing a smart charging system for EV charging facilities. Upon completion, the system would record the actual utilisation of the charging facilities.

3.5 Besides, as at the end of 2018, among the number of charging facilities listed in **Table 5**, seven and four facilities were installed respectively by HK Electric and an EV manufacturer at car parks under TD. Of them, a total of four quick charging facilities at the Rumsey Street Car Park and the Shau Kei Wan Car Park were provided by that EV manufacturer and installed at the parking spaces already equipped with standard charging facilities of EPD.

3.6 The distribution of EV charging facilities for public use in different districts of Hong Kong is listed in **Table 7**.

Table 7: Distribution of EV charging facilities for public use in different districts (including government and non-government car parks)

District	Number of public charging facilities (as at December 2018)			
	Standard	Medium	Quick	Total
Central & Western	62	110	36	208
Eastern	28	63	52	143
Southern	4	11	27	42
Wanchai	67	117	35	219
Kowloon City	64	1	15	80
Kwun Tong	214	81	42	337
Sham Shui Po	15	42	37	94
Wong Tai Sin	24	46	9	79
Yau Tsim Mong	101	42	50	193
Kwai Tsing	25	9	33	67
Tsuen Wan	17	46	9	72
Sai Kung	24	31	25	80
North	24	25	12	61
Tai Po	28	3	7	38

District	Number of public charging facilities (as at December 2018)			
	Standard	Medium	Quick	Total
Sha Tin	77	44	47	168
Yuen Long	46	33	18	97
Tuen Mun	10	10	17	37
Islands	14	110	27	151
Total	**844**	**824**	**498**	**2,166**

3.7 The car parks under TD and GPA which have already installed with charging facilities and are open to public use, as well as their total number of parking spaces, the number of parking spaces with charging facilities and their percentages over the total number of parking spaces are listed in **Table 8 and Table 9**.

Table 8: Number of parking spaces with charging facilities and their percentage over the total number of parking spaces at car parks under TD

	Car park under TD	Number (as at December 2018)		Percentage
		Parking spaces with charging facilities	Total parking space	
1	Star Ferry Car Park	39	380	10.26%
2	City Hall Car Park	30	170	17.65%
3	Rumsey Street Car Park	35	835	4.19%
4	Tin Hau Car Park	38	429	8.86%
5	Shau Kei Wan Car Park	35	386	9.07%
6	Yau Ma Tei Car Park	40	770	5.19%
7	Sheung Fung Street Car Park, Wong Tai Sin	35	268	13.06%

	Car park under TD	Number (as at December 2018)		Percentage
		Parking spaces with charging facilities	Total parking space	
8	Tsuen Wan Car Park	30	545	5.5%
	Total	**282**	**3783**	**Average: 7.45%**

Table 9: Number of parking spaces with charging facilities and their percentage over the total number of parking spaces at car parks under GPA

	Car park under GPA	Number (as at December 2018)		Percentage
		Parking spaces with charging facilities	Total parking spaces	
1	Queensway Government Offices^	20	163	12.27%
2	Wanchai Tower, Immigration Tower, and Revenue Tower^	30	157	19.11%
3	North Point Government Offices^	15	95	15.79%
4	Cheung Sha Wan Government Offices	30	250	12%
5	Sai Kung Government Offices^	20	70	28.57%
6	Sha Tin Government Offices^	20	110	18.18%
7	North District Government Offices^	15	105	14.29%
	Total	**150**	**950**	**Average: 15.79%**

^ Open to public use only outside office hours (i.e. in general 7 pm to 7 am on Mondays to Fridays; 24 hours on Saturdays, Sundays and public holidays).

3.8 Number of parking spaces with charging facilities at car parks under LCSD, HKHA and HKHS are listed in **Tables 10, 11 and 12** respectively.

Table 10: Number of parking spaces with charging facilities that are open to public use and their percentage over the total number of parking spaces at car parks under LCSD

	Car park at venue under LCSD	Number (as at December 2018)		Percentage
		Parking spaces with charging facilities	Total parking spaces	
1	Shek Kip Mei Park	2	53	3.77%
2	Yuen Chau Kok Complex	11	30	36.67%
3	Wai Tsuen Sports Centre	3	18	16.67%
4	Tsuen Wan Sports Centre (Opened in October 2018)	2	14	14.29%
	Total	**18**	**115**	**Average: 15.65%**

Table 11: Number of parking spaces with charging facilities and their percentage over the total number of parking spaces at car parks under HKHA

	Car park at public housing estate under HKHA	Number (as at Dec 2018)		Per-centage	Number (as at Dec 2018)		Per-centage
		Monthly parking spaces with charging facilities	Monthly parking spaces		Hourly parking spaces with charging facilities	Hourly parking spaces	
1	Yue Wan Estate, Eastern	0	148	0%	1	58	1.72%
2	Tung Shing Court, Eastern	1	66	1.52%	0	5	0%

	Car park at public housing estate under HKHA	Number (as at Dec 2018)		Per-centage	Number (as at Dec 2018)		Per-centage
		Monthly parking spaces with charging facilities	Monthly parking spaces		Hourly parking spaces with charging facilities	Hourly parking spaces	
3	Tung Tao Court, Eastern	4	240	1.67%	0	9	0%
4	Choi Tak Estate, Kwun Tong	0	219	0%	5	40	12.5%
5	Yau Lai Shopping Centre, Kwun Tong	0	50	0%	8	20	40%
6	Lower Ngau Tau Kok Estate, Kwun Tong	51	140	36.43%	3	18	16.67%
7	Domain, Kwun Tong	-	-	-	7	152	4.61%
8	On Tat Estate, Kwun Tong	80	246	32.52%	3	30	10%
9	Hong Wah Court, Kwun Tong	3	214	1.40%	0	20	0%
10	Lei On Court, Kwun Tong	3	381	0.79%	0	42	0%
11	Choi Ying Estate, Kwun Tong	4	135	2.96%	0	10	0%
12	King Shan Court, Wong Tai Sin	1	290	0.34%	0	30	0%

	Car park at public housing estate under HKHA	Number (as at Dec 2018)		Per-centage	Number (as at Dec 2018)		Per-centage
		Monthly parking spaces with charging facilities	Monthly parking spaces		Hourly parking spaces with charging facilities	Hourly parking spaces	
13	Kwai Chung Estate, Kwai Tsing	0	578	0%	10	69	14.49%
14	Easeful Court, Kwai Tsing	4	86	4.65%	-	-	-
15	Yi Fung Court, Kwai Tsing	6	204	2.94%	0	10	0%
16	Tak Long Estate, Kowloon City	51	170	30%	10	25	40%
17	Kai Ching Estate, Kowloon City	27	115	23.48%	19	25	76%
18	Chun Man Court, Kowloon City	3	395	0.76%	-	-	-
19	Shui Pin Wai Estate, Yuen Long	2	118	1.69%	2	40	5%
20	Hung Fuk Estate, Yuen Long	38	115	33.04%	3	24	12.5%
21	Long Ching Estate, Yuen Long	0	10	0%	1	1	100%
22	Long Shin Estate, Yuen Long	7	31	22.58%	4	6	66.67%

	Car park at public housing estate under HKHA	Number (as at Dec 2018)		Per-centage	Number (as at Dec 2018)		Per-centage
		Monthly parking spaces with charging facilities	Monthly parking spaces		Hourly parking spaces with charging facilities	Hourly parking spaces	
23	Mei Tin Estate, Sha Tin	9	277	3.25%	11	20	55%
24	Cheung Sha Wan Estate, Sham Shui Po	8	21	38.10%	3	9	33.33%
25	So Uk Estate Phase 1, Sham Shui Po	15	47	31.91%	-	-	-
26	Shui Chuen O Estate, Sha Tin	111	333	33.33%	15	70	21.43%
27	Sheung Chui Court, Tsuen Wan	16	51	31.37%	2	6	33.33%
28	Po Heung Estate, Tai Po	11	17	64.71%	25	100	25%
	Total	**455**	**4,697**	**Average: 9.69%**	**132**	**839**	**Average: 15.73%**

Table 12: Number of parking spaces with charging facilities and their percentage over the total number of parking spaces at car parks under HKHS (most are for exclusive use by residents, commercial tenants and visitors)

	Car park under HKHS	Number (as at December 2018)		Percentage
		Parking spaces with charging facilities	Total parking spaces	
1	Lai Tak Tsuen	1	160	0.63%
2	Ka Wai Chuen	1	238	0.42%
3	Mountain Shore	1	375	0.27%
4	Serenity Place	2	534	0.37%
5	The Pinnacle	1	476	0.21%
6	Park Belvedere	1	441	0.23%
7	Bo Shek Mansion	2	110	1.82%
8	Harmony Place	19	51	37.25%
9	Highland Park	1	368	0.27%
10	Kai Tak Garden	1	326	0.31%
11	Prosperous Garden	1	141	0.71%
12	Greenview Villa	51	103	49.51%
13	Kwun Tong Garden Estate	1	396	0.25%
14	Heya Aqua	2	43	4.65%
15	Heya Crystal	10	58	17.24%
	Total	**95**	**3,820**	**Average: 2.49%**

NUMBER OF GOVERNMENT VEHICLES

3.9 The numbers of government vehicles (including different types of vehicles such as saloon cars, specialised vehicles, buses, trucks and motorcycles) between 2011 and 2018 are listed in **Table 13**.

Table 13: Number of different vehicles in the government fleet (by fuel type)

Fuel type	Number of vehicles							
	2011	2012	2013	2014	2015	2016	2017	2018
Electric	**33 (-)**	**50 (51.5%)**	**156 (212%)**	**226 (44.9%)**	**244 (8%)**	**249 (2%)**	**254 (2%)**	**253 (-0.4%)**
Petrol	4,354 (-)	4,359 (0.1%)	4,063 (-6.8%)	3,955 (-2.7%)	3,736 (-5.5%)	3,846 (2.9%)	3,701 (-3.8%)	3,659 (-1.1%)
Diesel	1,702 (-)	1,679 (-1.4%)	1,872 (11.5%)	1,984 (6%)	2,190 (10.4%)	2,128 (-2.8%)	2,336 (9.8%)	2,389 (2.3%)
LPG	254 (-)	255 (0.4%)	252 (-1.2%)	265 (5.2%)	272 (2.6%)	269 (-1.1%)	262 (-2.6%)	261 (-0.4%)
Total	**6,343** (-)	**6,343 (0%)**	**6,343 (0%)**	**6,430 (1.37%)**	**6,442 (0.19%)**	**6,492 (0.78%)**	**6,553 (0.94%)**	**6,562 (0.14%)**

( ) Figures in brackets represent the percentage increase/decrease in that year over the previous year.

COMPLAINT STATISTICS

3.10 In the past four years, the numbers of complaints received by relevant Government departments and HKHS about occupation of parking spaces with charging facilities by non-EVs are listed in **Table 14**.

Table 14: Complaints received by Government departments and HKHS about occupation of parking spaces with charging facilities by non-EVs

Government department	Number of complaints			
	2015	2016	2017	2018
TD	6	11	14	20
GPA	1	2	3	2
LCSD	0	0	0	0
HD	0	0	2	3
HKHS	0	0	0	0
Total	**7**	**13**	**19**	**25**

4

PUBLIC VIEWS AND OUR SITE OBSERVATIONS

(I) VIEWS FROM MEMBERS OF THE PUBLIC AND DIFFERENT SECTORS

4.1 During our investigation, we have received views from the automotive industry and members of the public on the Government's implementation of measures on promotion of EV. Moreover, we have made enquiries of CLP, HK Electric and HKPC on this matter. Views from the various sectors on the development of EVs in Hong Kong, the planning and arrangements for ancillary facilities and the way forward for EVs are elaborated as follows.

(1) EV Development Trend

4.2 As EVs have zero emissions when driving, it can effectively reduce roadside air pollution. However, some comment that EVs simply shift vehicle emissions from roadside to power plants. Besides, EVs use mainly lithium batteries, which can cause environmental pollution if the mining of lithium and the manufacturing and disposal of lithium batteries are not properly processed. Hence, there is still room for discussions as to whether EVs are genuinely environment-friendly. Notwithstanding the aforesaid, use of EVs continues to be the major global trend, and many countries have started to promote the use of EVs proactively. In some countries, schedules have been planned for phasing out petrol vehicles (see **para. 6.1** for details).

<u>HKPC's Views on Development of EPVs and Ancillary Facilities</u>

4.3 In HKPC's view, the future development of EPV market depends on various factors. For instance, whether the types of EVs available can meet the market demand,

the pricing of EVs and the adequacy of ancillary facilities. Given the strong demand of EPV owners for charging facilities, increasing the number of ancillary facilities will be a major incentive for drivers to choose EVs. In addition, introducing affordable EV models to the market can also help to promote EPVs.

4.4 To assist the development of EVs and ancillary facilities, between 2016 and 2018, HKPC had developed systems including the Load Management System, Portable Charger Kit and Smart EV Mobilised Charger to help to resolve the problem of inadequate charging facilities. Those systems are currently on trial run. Moreover, HKPC has developed for the Hong Kong Airport Authority an Electric Ground Service Equipment Parking Bay Monitoring System for managing charging facilities. For example, the system can instantly locate available charging spaces. HKPC has introduced this system to relevant Government departments and industry/trade organisations. To tie in with the opening up of Government data, HKPC expects the system to be more widely used in other areas in future.

(2) Policy on Promoting the Use of EPVs

4.5 Some people in the automotive industry consider the Government policy on EPVs self-contradictory. Cancellation of the FRT exemption for EVs has impeded the development of EVs and caused further increase in the number of petrol vehicles, which is contrary to the existing environment-friendly policy. Moreover, some politicians have criticised that the reduction in tax concessions for EVs has no effect on supressing the growth of private vehicles because EVs only account for a tiny percentage of vehicles among different kinds of vehicles in Hong Kong (less than 2%, see **Table 1** under **para. 3.1**). There are views that the Government should encourage vehicle owners to replace petrol vehicles with EVs so that the objective to reduce emissions can be achieved and the growth of private vehicles can be reduced.

4.6 Some EV owners have criticised the Government for lacking a long-term objective on promoting the use of EVs. They purchased EVs to support the Government policy on promoting the use of EVs, but afterwards found that the measures adopted by the Government were contrary to its policy. They were thus confused and did not know what to do. Some politicians even believe that the Government should reinstate the FRT wavier for EPVs to encourage vehicle owners to consider EV when looking for a replacement.

4.7 Meanwhile, there have been comments that as EPVs are gaining more acceptance among drivers, with advancement in technology and reduction in production costs, the popularity of EV will not decline even though the Government reduces the concessions. The crux of the matter is the adequacy of charging facilities.

4.8 Nevertheless, those who are against the promotion of use of EVs consider it unfair for the Government to provide FRT exemption for EVs. It is because EPVs are generally more expensive than petrol vehicles, that FRT exemption will lead to a significant decrease in the Government's revenue and may somehow become a subsidy to the affluent persons for purchasing such luxurious goods.

(3) Number of Charging Facilities

4.9 Among the public views we received, many people consider the provision of charging facilities for EVs inadequate. Some politicians considered that the Government should not take a secondary role in the provision of charging facilities because provision of such facilities is a key factor in drivers' decision on whether to change to EVs. Instead, the Government should take the lead to provide more charging facilities to encourage other public and private organisations to follow suit.

4.10 Furthermore, although the Government has organised seminars to encourage property management companies to install charging facilities for EVs in existing housing estates, some residents noted that many owners' corporations and property management companies refused to let them install charging facilities at their own parking spaces. The reasons for refusal included high installation fee and insufficient power capacity at the car parks. These have created obstacles for vehicle owners in installing charging facilities. EV owners generally consider the Government has not provided them with adequate support for installation of charging facilities, nor had it offered any incentive to encourage private car parks to install charging facilities.

4.11 As regards newly constructed buildings, the Government has tightened the GFA concessions since 2011 to encourage developers to equip private car parks in those new buildings with basic infrastructure for installing EV charging facilities. Nevertheless, media reports later revealed that some of the infrastructure, built by developers who had benefited from the concessions, were not connected to power supply. The Government explained that provision of EV charging facilities and connection to an electricity meter for power supply at individual parking spaces is not a mandatory requirement for the GFA concessions (see **para 5.20**). However, some politicians

considered such charging facilities might as well be non-existent, and questioned the Government's determination in promoting the use of EVs.

Opinions of the Two Power Companies on the Installation of Charging Facilities

4.12 At present, both power companies provide "one-stop" service to EV owners for installing charging facilities. The services include, *inter alia*, site inspections, technical advice and connection to power supply. To equip private parking spaces with charging facilities, sufficient space and electricity capacity for the installations in the building concerned are indispensable. Approval of the owners' corporation or owners' committee of the building is also required. Meanwhile, both CLP and HK Electric have already extended the free charging service at their EV charging points to 31 December 2019.

4.13 On the other hand, in the course of handling public enquiries, the two power companies noticed that vehicle owners often encountered the following hurdles when they installed EV charging facilities in existing buildings:

(1) owners' corporations and management companies of buildings were worried that installing charging facilities might overload the existing electrical installations of their buildings;

(2) charging facilities might take up the remaining power supply quota of the car parks, and thereby impede future development of the car parks;

(3) laying cables, installing related facilities and modifying low-voltage switchboards are costly;

(4) some car parks are lack sufficient space for additional power installations; and

(5) charging facilities installed might take up common resources of the buildings but benefit only EV owners. This might give rise to disputes about equity.

(4) Efficiency of Charging Facilities

4.14 Some members of the transport sector indicated that as the driving range and charging technology of EVs improve standard charging facilities with a standard charging speed (see **Table 7** under **para. 3.6**) simply cannot catch up with the developments of EV. Currently, almost 40% of the charging facilities in the territory are of standard charging speed. The long charging time cannot keep abreast of the times.

4.15 Some politicians pointed out that in view of the different charging systems adopted by EVs manufactured in different countries, the Government should review the feasibility of increasing the compatibility between various charging systems, and explore ways to effectively set up more multi-system charging installations.

(5) Utilisation of Charging Facilities and Management of Parking Spaces Equipped with the Facilities

4.16 Hong Kong is a small city with a dense population and most people live in high-rise buildings. It is difficult to set up charging points outdoors or in open sites. Consequently, majority of the EV charging facilities are now installed at parking spaces inside car parks.

4.17 Some EV owners noted that parking spaces equipped with charging facilities at government car parks were always occupied by non-EVs. Since such parking spaces are usually located near the entrance/exit of car parks, they are often taken up by non-EVs, making it impossible for EVs to charge their batteries. Some EV owners, therefore, suggested that charging facilities be set up at locations relatively far away from main entrance/exit (such as on floors several levels away from where the entrance/exit is, or at locations far away from pedestrian entrances/exits) to minimise the chance of charging spaces being occupied by non-EVs. EV owners really in need can then charge up their vehicles at those parking spaces.

4.18 Besides, the majority of public opinions this Office received considered that there should be charging spaces at government car parks for the exclusive use of EVs. Some EV owners further called for strengthening of car park management. Just like those parking spaces currently designated for drivers with disabilities, charging spaces for EVs should be regulated by legislation to prohibit petrol vehicles from occupying them. Some people held that charging facilities are set up for EVs to charge their

batteries. It would be a waste of public resources if poor management resulted in the charging spaces being occupied by non-EVs.

4.19 Some EV owners revealed that charging facilities at some government car parks were poorly maintained and broke down frequently. As a result, they could not have their EVs charged up even though the vehicles were parked at charging spaces.

(6) Handling of Retired Batteries

4.20 Some environmental groups indicated that the batteries of EVs have an average lifespan of five to seven years. With the gradual retirement of the batteries used in the EVs that first entered the local market in 2010, the number of retired batteries are expected to soar. In fact, before introducing EVs into their countries, most overseas governments already made it a mandatory requirement that manufacturers must formulate a policy to re-use or properly dispose of the retired batteries. On the contrary, there is neither any mandatory requirement for proper disposal of retired batteries by the manufacturers, nor a system for proper disposal of retired batteries in Hong Kong.

(II) OUR SITE OBSERVATIONS

4.21 To understand more about the utilisation of EV charging facilities at government car parks, our investigation officers conducted site observations between January and March 2019 at the Rumsey Street Car Park, Star Ferry Car Park, Cheung Sha Wan Government Offices Car Park and Tsuen Wan Car Park. Our observations are as follows.

(1) Rumsey Street Car Park (Managed by TD)

4.22 The Rumsey Street Car Park is located in the Sheung Wan business district on Hong Kong Island. Most parking spaces equipped with charging facilities are on the first floor of the car park, which is quite convenient because that floor is connected by a footbridge.

4.23 On one morning, we found during the visit that all the charging spaces in the car park were occupied, and most of them were taken up by non-EVs (see **Figure 1**) despite that parking spaces are available on upper floors of the car park (see **Figure 2**). In the afternoon of the same day, some EVs, having started charging in the morning,

were already fully charged up but still remained at those charging spaces. In other words, other EVs could not use those parking spaces for charging purpose.

4.24 During the visits, our officers also noticed several particular EVs were often parked at the Rumsey Street Car Park to charge up. It was likely that those EV owners relied on the public chargers at that car park for daily charging of their EVs.

4.25 Our officers had asked the car park manager about requests from EV owners for using the charging spaces. The manager indicated that EV owners were free to use the charging spaces any time, but they would have to wait if those spaces had been occupied by non-EVs. The manager would not request non-EV owners to vacate those parking spaces.

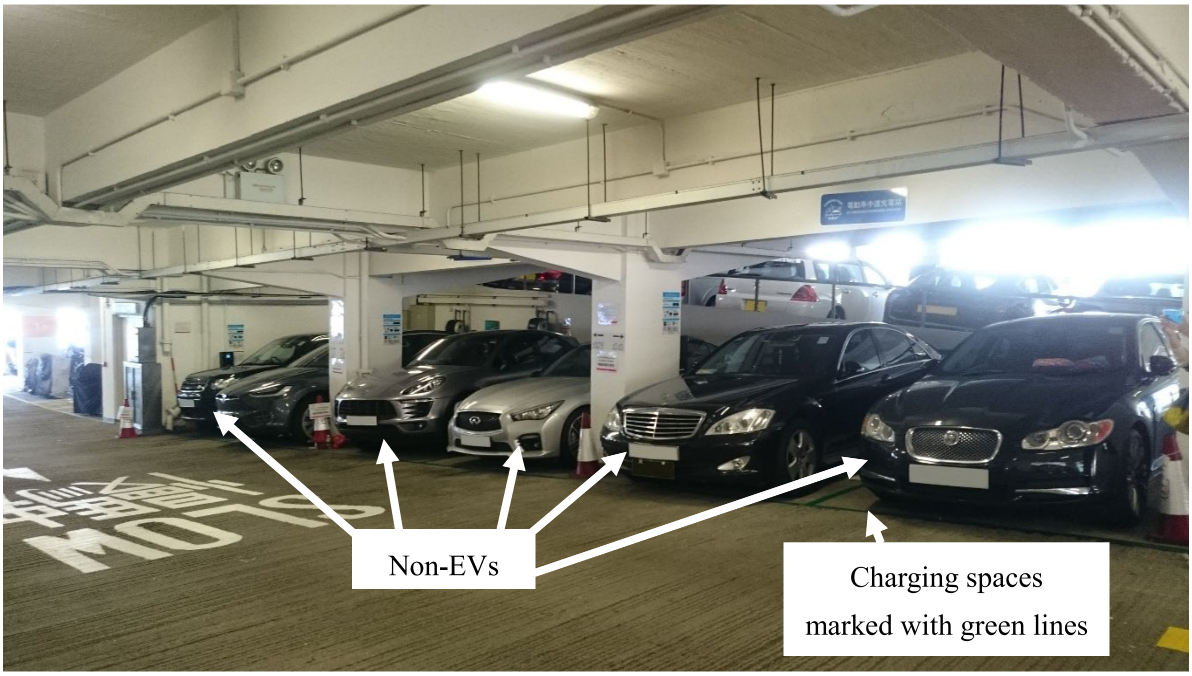


Figure 1: Charging spaces occupied by non-EVs



Figure 2: Parking spaces were available on an upper floor (7/F) of the car park

(2) Cheung Sha Wan Car Park (the only car park managed by GPA and open to public use round-the-clock)

4.26 The Cheung Sha Wan Car Park comprises four storeys. Its level B4 is for the exclusive use of government vehicles. Levels B2 and B3 provide hourly parking spaces and exclusive parking spaces for government vehicles (hourly parking spaces on level B3 are open between 7:15 pm and 7 am, while the hourly parking spaces on level B2 open 24 hours). The entire level B1 is designated for hourly parking spaces. The parking spaces equipped with charging facilities are located on level B1 near the car park entrance/exit. Although notices are displayed conspicuously near those charging spaces and at the car park gate stating that “EVs in need of charging are given priority to use available spaces marked ‘Priority Parking Space for EV’”, most of the charging spaces were parked with non-EVs during our visits (see **Figure 3**).

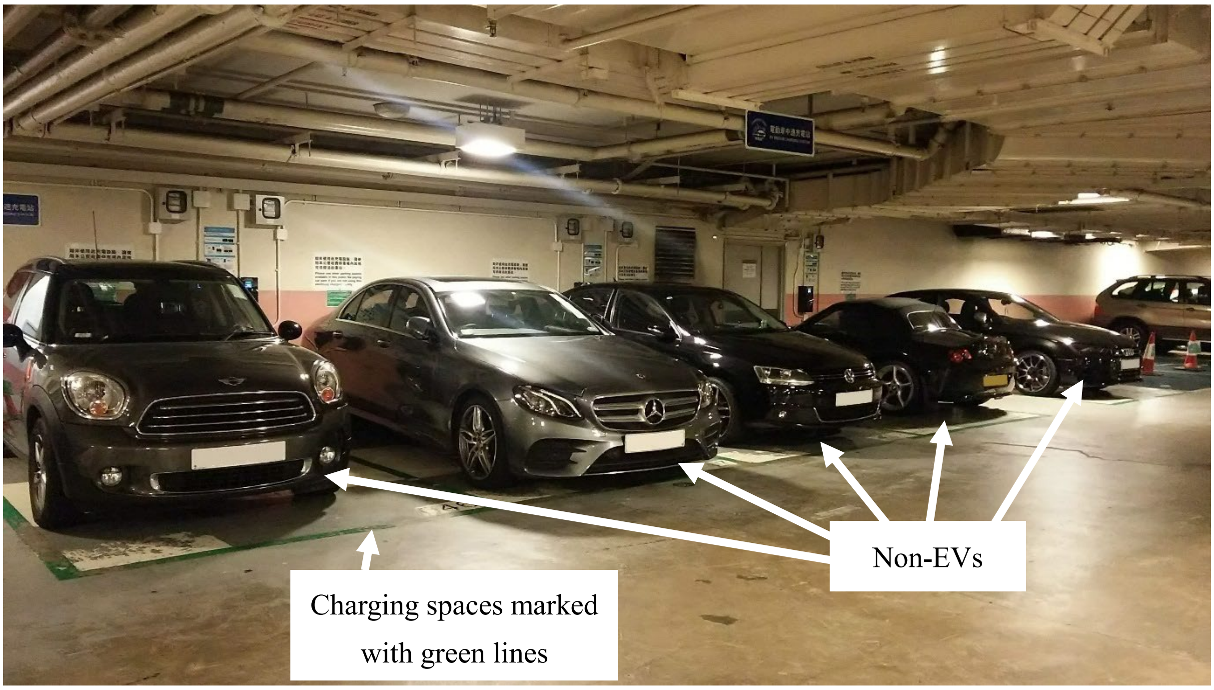


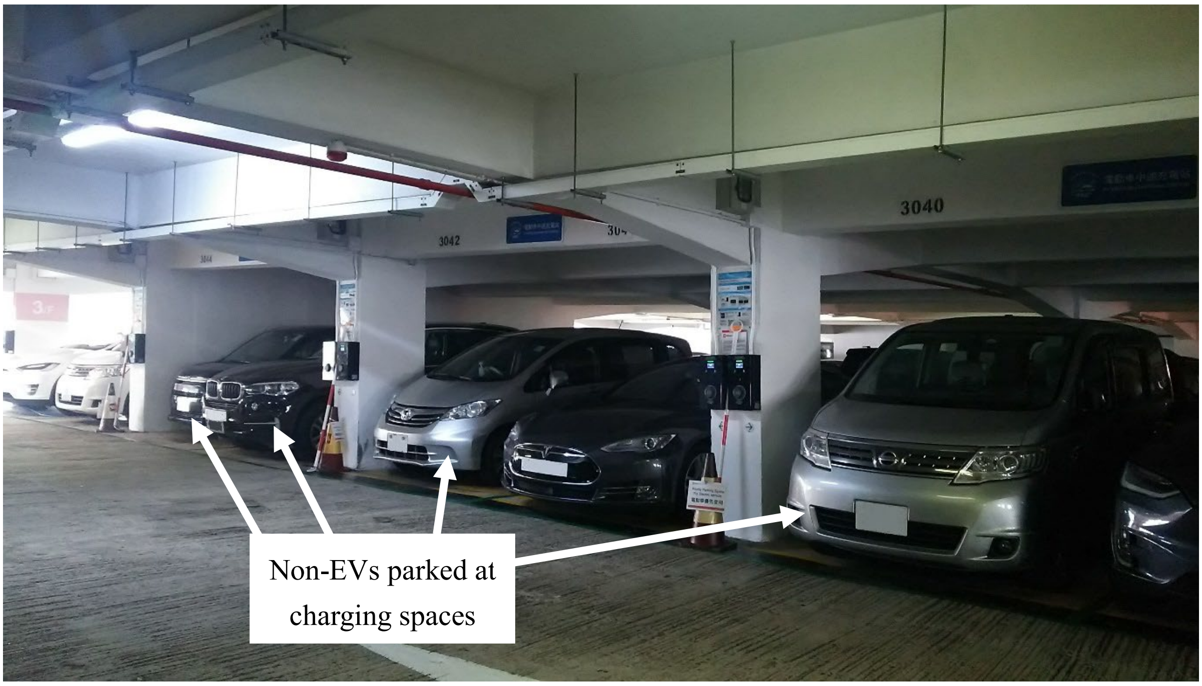
Figure 3: Non-EVs parked at charging spaces

(3) Tsuen Wan Car Park (Managed by TD)

4.27 The hourly parking spaces are located on the 4th to 8th floors. The parking spaces equipped with charging facilities are on the 4th floor near the car park entrance/exit (see **Figure 4**). During our visits, most of the charging spaces were taken up by non-EVs (see **Figures 5** and **6**). Traffic cones were placed at some available charging spaces, indicating that EVs were given priority (see **Figure 7**). Most EVs parked at those charging spaces were fully charged up (see **Figure 8**).



Figure 4: Parking spaces with charging facilities located near the car park entrance/exit



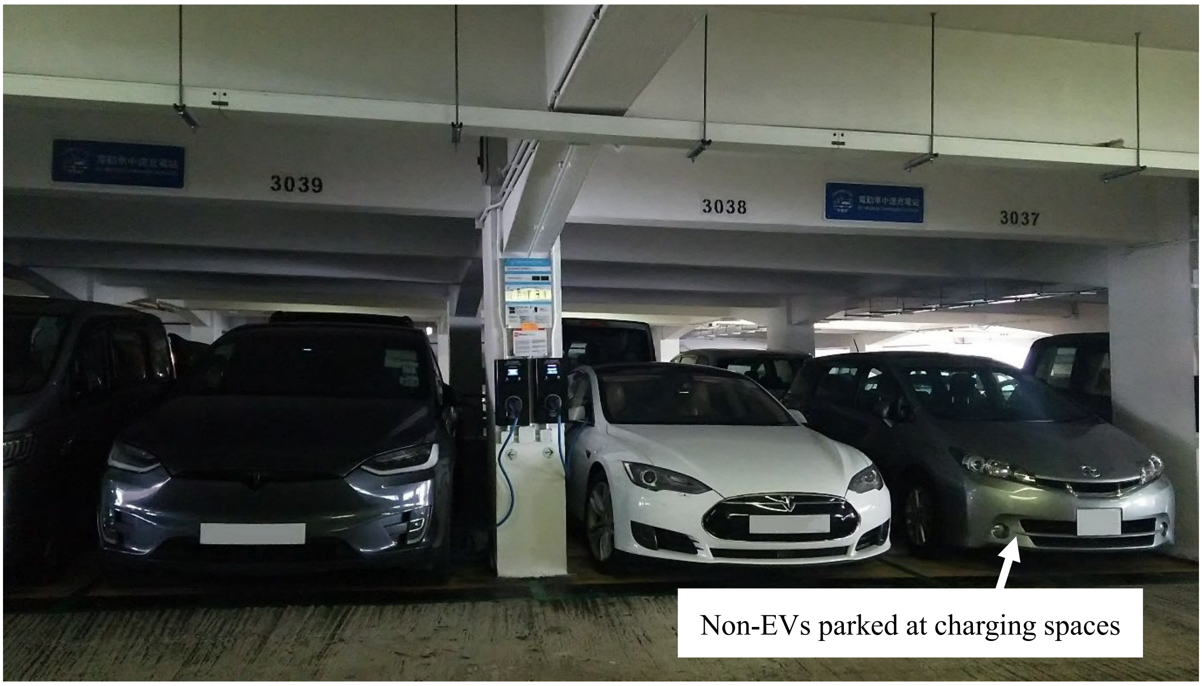


Figure 5 (above) and 6 (below): Most of the charging spaces were taken up by non-EVs



Figure 7: A traffic cone placed by car park management office at the available charging space, indicating that EVs were given priority



Figure 8: An EV continued to park at the space after charging is completed

4.28 On a certain day of visit, our officer saw a non-EV owner removing the traffic cone placed at the charging space to park his own vehicle at that space (see **Figures 9** and **10**). However, there were parking spaces available on an upper floor of the car park at that time (see **Figure 11**).





Figure 9 (above): A traffic cone with "EV priority" sign originally placed at the charging space was removed; **Figure 10 (below):** A non-EV then parked at that space



Figure 11: Parking spaces were available on an upper floor (8/F) of the car park

(4) Star Ferry Car Park (Managed by TD)

4.29 The Star Ferry Car Park has two storeys of parking spaces. Most of the parking spaces equipped with charging facilities are located on the ground floor, while the quick chargers set up by HK Electric are located on the upper floor (see **Figure 12**). Green signs of EV charging facilities are conspicuously displayed on the walls in the vicinity of the charging spaces (see **Figure 13**). As in other car parks, most of the charging spaces were taken up by non-EVs.



Figure 12: Quick chargers set up by HK Electric on the upper floor of the car park

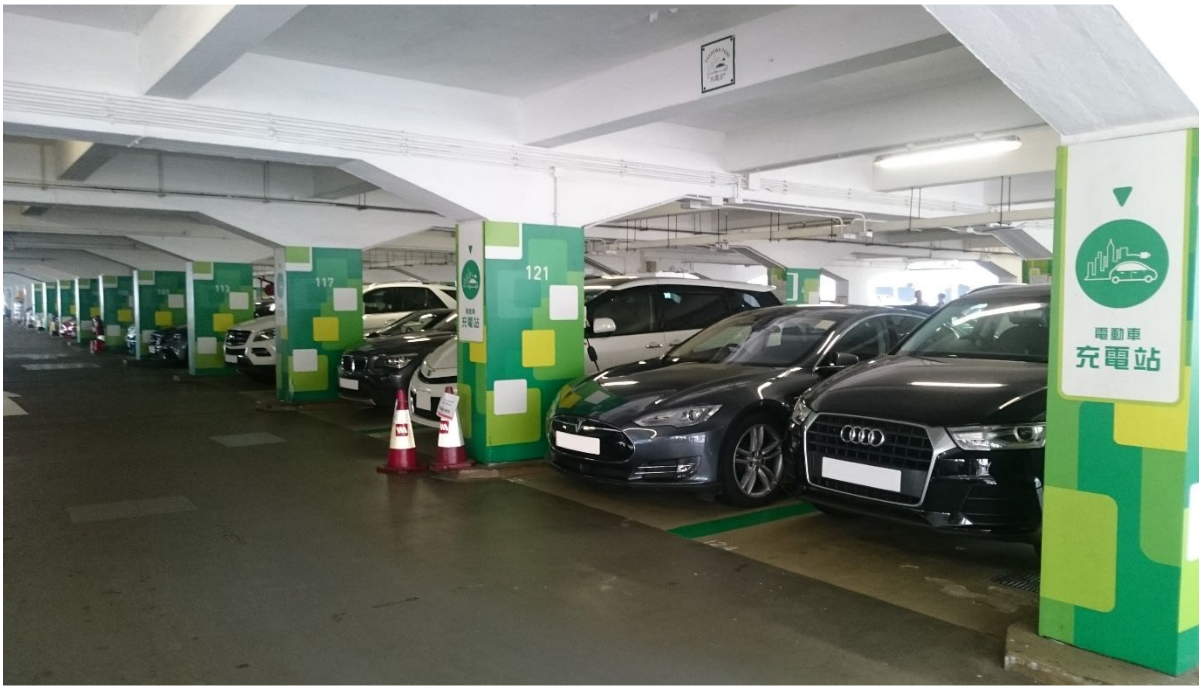


Figure 13: Green signs of EV charging facilities displayed on the walls in the vicinity of charging spaces

Overall Observations

4.30 Summarising of the utilisation of charging spaces at government car parks mentioned above, we have the following observations:

(1) Charging spaces were frequently occupied by non-EVs;

(2) Some EVs continued to occupy the charging spaces after charging was completed;

(3) Charging spaces were usually located near the car park entrance/exit or on the floor connected with a pedestrian passageway;

(4) Despite there were vacant parking spaces in the same car park, non-EVs were often parked at charging spaces as their locations were more convenient; and

(5) Some of the car parks failed to display the notice about the detailed arrangements of "Priority Parking Space for EV".

4.31 There were not any signs at the car park entrance/exit indicating on which floor the charging spaces were located. While those charging spaces were marked by green lines, and there were signs above them indicating "EV medium charging points", the signs or notices indicating the location of charging spaces in three government car parks (the Rumsey Street Car Park, Cheung Sha Wan Government Offices Car Park and Tsuen Wan Car Park) were not as clear as those in the Star Ferry Car Park and other private car parks (most of those car parks had green signs of EV charging facilities displayed at the charging points, or had walls near those parking spaces covered with green wallpaper).

5

RESPONSE FROM GOVERNMENT

(I) POLICY AND TARGET ABOUT ELECTRIC VEHICLE

5.1 EPD indicated that the Government has all along been committed to promoting the use of EVs, and considered that replacing conventional vehicles with EVs can help improve roadside air quality and reduce greenhouse gas emissions. The policy on promoting the use of EVs must take into account the technological development, market supply and competitiveness of EVs and public acceptance, with corresponding measures formulated to keep abreast of the times. The Government, therefore, adopted a wide range of measures to promote the use of EVs. Details of those measures are given in **paragraph 2.25**.

5.2 EPD stressed that since commercial vehicles are the major source of roadside air pollution, ECV is the focus of the Government on promoting the use of EVs. Yet, the development of EPVs in recent years has far outpaced that of ECVs, bringing more public attention to EPVs. The Government had to balance the different pace of development between EPVs and ECVs, and adjust its measures in a timely manner. Actually, the Government had explained its policy adjustment in detail. Regarding private vehicles, the Government's policy is to encourage the use of public transport as far as possible, and encourage members of the public who need to purchase private vehicles to choose EVs (see **para. 2.20**).

5.3 Chapter 8 of the HKPSG states that "the Government's longer term target is that as far as private cars are concerned, 30% are EVs or hybrid by 2020" (see **para. 2.13**). ENB explained that the Government outlined this hypothetical scenario proposed by the consultant, in the Public Consultation on Hong Kong's Climate Change Strategy and Action Agenda released in September 2010. The "target" mentioned in

HKPSG is simply a vision made on the basis of the above hypothetical scenario. The Government has not set any target for individual types of vehicles. EPD indicated that with hindsight, the relevant statement is too optimistic, but EPD has no relevant records showing whether the Government should "accept" the 30% "target" proposed by the consultant. ENB will follow the established procedures to review the relevant content in the HKPSG in accordance with its prevailing policy.

(II) NUMBER OF ELECTRIC VEHICLES

5.4 With significant advancement in the technology of EPVs in recent years, the performance of EPVs can better meet the demands of motorists. As a result, EPVs have become more widely accepted by the motorists, and the price difference between EPVs and conventional petrol vehicles is narrowing, leading to a rapid growth in the number of EPVs. Meanwhile, the development of ECVs, which can effectively reduce roadside air pollution, has lagged behind. In this light, the Government reviewed the arrangements of FRT concession for EPVs in 2017 and 2018 (see **para. 2.21**). That policy, while conforming to the principle of preventing the increase of private vehicles, can encourage EV supplies to introduce more economical and affordable EPV models to Hong Kong, thereby enhancing the popularity of EPVs as well as ensuring proper use of public funds. EPD explained that many places in the world had reduced or withdrawn subsidies for EPVs, with a view to motivating manufacturers to introduce more economical and affordable EPV models and enhancing the popularity of EPVs in the long run[8].

5.5 Moreover, the Government has adopted a public transport-oriented policy with railway as backbone. In the past few years, the number of newly registered private vehicles has continued to rise. If members of the public rely too much on private vehicles as their daily means of transport, it will not only cause serious traffic congestion, but also offset the effect of measures for improving roadside air quality. The Government, therefore, considered the new arrangements of FRT concession for EPVs can strike a proper balance between promoting the use of EPVs and stemming the continuous growth of private vehicles.

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[8] For instance, mainland China is gradually reducing the subsidies for EVs, and will withdraw the subsidies in 2020. In the province of Ontario, Canada, the subsidies for EVs had been withdrawn in 2018. The United States and the United Kingdom are also gradually reducing the subsidies for EVs.

5.6 According to information from TD, the number of licensed EPVs in Hong Kong has shown an increase of about 21 times between the end of 2013 and the end of 2016 (excluding government EVs). In 2017, TD had analysed samples taken from newly registered EPVs. The result revealed that over half of those EPV owners were new buyers or already owned at least one private vehicle. The findings indicated that those owners did not purchase the EPVs for replacement. Consequently, the number as well as the overall growth rate of private vehicles increased.

Number of EVs Procured by Government

5.7 GLD stated that ENB has all along encouraged Government departments to procure EVs to replace government vehicles due to retire. The Government has not set any targets or implementation schedule on the number or proportion of EVs purchased in the government fleet. However, in order to support the relevant policy, GLD will give priority to environment-friendly vehicles (including EVs) when replacing vehicles in the government fleet which are due to retire. In deciding whether to procure EVs, GLD still needs to consider factors such as the operational needs of departments, ancillary charging facilities, maturity of technology (including vehicle performance, battery durability and driving range of the vehicles), and availability of resources. At present, there are more than 250 EVs of different models in the government fleet. The numbers of EVs (including saloon cars, specialised vehicles, buses, trucks and motorcycles) procured by the Government between 2011 and 2018 are given in **Table 13** under **paragraph 3.9** above.

5.8 According to information from GLD, a Government department applying for vehicle replacement is required to state its reasons if it does not choose to use EVs. In the past, the main reasons given by departments included: the vehicles were to be deployed at different work shifts and would not have sufficient time for charging; lack of charging facilities during field work or at workplaces; the performance of EV batteries would decline gradually and cause disruption to daily operation; and the carrying capacity of the types of EV available failed to meet the operational needs. Meanwhile, the market strategies of manufacturers or suppliers would also affect Government's decision to purchase EVs. For instance, a manufacturer may stop supplying certain types of EV to Hong Kong market.

5.9 EPD stated that at present the government fleet is comprised mainly of specialised vehicles (such as refuse collection vehicles and ambulances), buses and trucks. However, the technology of EVs in those categories are still immature. There

are no suitable vehicle models available on the market that can meet the operational needs of the departments. As for saloon cars (i.e. the private vehicle category), as at the end of 2018, the Government owned 169 electric saloon cars, representing around 11% of all saloon cars in the fleet. Since the electric saloon cars in the early days could not fully meet the operational needs of departments, and their driving range would shorten as the batteries deteriorate, departments have become more circumspect in procuring these vehicles. Nevertheless, with the improvement of EPV performance in recent years, the Government will continue to keep watch on the latest technological development of EVs, and will consider replacing the retired vehicles with reference to the availability of suitable models in the market, and compatibility between the performance of vehicles and the operational needs of departments.

(III) INSTALLATION OF CHARGING FACILITIES

(1) Number of Charging Facilities

5.10 EPD stated that the number of public charging facilities available changed due to a number of factors, such as the technological development and market situation of EPVs and charging facilities. It is not necessarily consistent with the growth rate of EPVs. Whether the Government would enhance the efficiency of public charging facilities, the cost effectiveness of the facilities is an important factor.

5.11 In the early 2010s, the driving range of EPVs in general was only around 100 kilometres, which might cause range anxiety to drivers. Hence, it was necessary to set up an extensive public charging network for EV drivers to replenish the batteries of their vehicles during a journey. Currently, the tested driving range of EPVs can reach 280 to 400 kilometres (depending on the brands and models of the EVs). Given that the daily mileage of private vehicles is generally a few tens of kilometres, vehicle owners should be able to complete their daily journeys after having their vehicles fully charged up at home or in the workplace. They should have little need for energy replenishment by using public charging facilities. According to the Government's current policy, public charging network mainly serves as supplementary facilities, it is set up to meet the occasional needs of drivers to replenish the charge of their EVs for completing a journey (see **para. 2.23**). As a result, the Government does not consider it justified to allocate a large amount of public funds to provide public charging facilities for EPVs. Moreover, there are already private companies on the market providing one-stop charging services for EVs, including installation of charging facilities and provision of

charging services at the EV owners' car parks.

5.12 Moreover, the technological development of charging facilities has shown significant advancement. Comparing with the standard chargers in the past, medium and quick chargers can reduce the charging time by around 60% and 90% respectively. As a result, the time required by EV owners for charging up their vehicles is much shorter than before.

5.13 Although the Government does not have any specific objective for charging facilities, given the increasing popularity of EVs, the Government has engaged a consultant to collect relevant information on EVs and charging facilities worldwide. This will help the Government to formulate a long-term policy conducive to the promotion of EV development in Hong Kong.

5.14 As regards the installation of charging facilities at government and private car parks, the Government has adopted the following measures.

(A) Government Car Parks

Existing Government Car Parks

5.15 In 2012, the Government took the lead in installing 500 public charging facilities at the public car parks managed by TD and GPA. To enhance the charging efficiency of such facilities, EPD completed the work of upgrading the standard chargers to medium chargers at government public car parks in February 2018 (see **para. 2.22**).

5.16 EPD pointed out that at present, around 7% of the parking spaces at government public car parks are equipped with charging facilities. As EPVs only account for less than 2% of all private vehicles in Hong Kong (see **Table 1** under **para. 3.1**), and the utilisation rates of those charging facilities are low, EPD did not consider there was a need to significantly increase the number of charging facilities at government public car parks, given that such facilities are supplementary in nature. However, as long as such criteria as proper use of public funds and cost effectiveness are met, EPD will consider introducing enhancement measures where necessary, including reviewing the pilot scheme on outdoor charging facilities to see whether such facilities can be installed at other government car parks.

Newly Constructed Government Car Parks

5.17 With reference to the HKPSG and/or the circular on Green Government Buildings, the Government will install charging facilities for not less than 30% of the private vehicle parking spaces at newly constructed government car parks in future.

(B) Private Car Parks

Existing Private Car Parks

5.18 Between September 2011 and November 2017, the Government had issued letters to owners' corporations and owners' committees of private buildings, and to public and private organisations in different sectors for four times, appealing to them to use EVs and install EV charging facilities[9]. The sectors covered in the exercise included banking, telecommunication, transport, hotels, property management, education and hospitals.

5.19 In 2011, EPD set up a dedicated team and a service hotline to provide information and technical support for parties interested in setting up charging facilities. The Department also called on owners' corporations or owners' committees to facilitate requests for the installation of charging facilities from EV users, and shared successful experiences with the property management sector. The two power companies also provided EV owners with one-stop services including site inspections, technical advice and connection to power supply (see **para. 4.12**).

Newly Constructed Private Car Parks

5.20 To encourage new private building developments to install charging facilities, GFA concessions for private car parks in newly constructed buildings were granted in 2011 to lure property developers to provide infrastructure for EV charging facilities at the car parks (see **para 2.14(5)**). On media reports that the socket outlets of EV chargers installed by some developers in newly constructed buildings could not be used for charging EVs batteries, the Government explained that under the said policy of GFA concessions, developers are only required to install infrastructure for EV charging facilities, rather than the charging facilities. This requirement aimed at allowing

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[9] ENB/EPD issued letters separately to more than 7,400 owners' corporations and owners' committees; 150 public bodies, large-scale enterprises and non-profit-making organisations; 140 property management or car park management companies; and eight public organisations.

owners of those parking spaces to install charging facilities and arrange for power supply in future according to their actual needs. Whether and when individual parking spaces would be installed with charging facilities depends on the future needs of the parking space owners, such as whether they would use EVs and provide EV charging service to their visitors.

(2) Utilisation Rate of Public Charging Facilities

5.21 EPD considered that the current utilisation rate of public charging facilities at government public car parks is relatively low. Between January 2016 and December 2018, each standard/medium charger was used 14 times per month on average (based on the electricity consumption level), i.e. less than once each day. As for the utilisation rate of public charging facilities at non-government public car parks, the data provided by the two power companies showed that during the same period, each standard/medium charger installed by them at public car parks was used 34 times per month on average, i.e. around 1.1 times each day, which is still at a low level. The Government admitted that it does not have any data on the utilisation of public charging facilities at other non-government public car parks. It would conduct a survey in order to grasp such data in a more comprehensive manner in the future.

(3) Implementation of Enhanced Measures

5.22 In view of the rapid changes in the utilisation of EVs, the Government has reviewed the relevant policies and measures, and will implement the following measures:

(1) To develop the public charging network as ancillary facilities, it was announced in the 2019/20 Budget that the Government would earmark $120 million for expanding the EV public charging network at government car parks in the coming three years. The plans would include the installation of more than 1,000 additional medium chargers at car parks under TD, GPA and LCSD that are fully or partially open to the public. The Government will also, on a trial basis, identify suitable roadside parking spaces for installing EV chargers and explore viable locations to build quick EV charging points;

(2) To revise the requirement for EV charging facilities in newly constructed government properties. The original requirement of "not less than 30% of indoor parking spaces to be equipped with medium

chargers" would be extended to new outdoor government car parks;

(3) To further promote the installation of charging facilities. For example, the Government would continue to strengthen communication with property owners, property management companies and owners' corporations on the installation of EV charging facilities, and to step up publicity, public education and provision of technical assistance. The guidelines on charging up EVs and those on charging facilities in the HKPSG would be updated as appropriate to recommend that all newly installed EV chargers be upgraded from standard to medium chargers so as to match the latest developments in EVs and EV charging technology; and

(4) Apart from completing the conversion of standard chargers into medium chargers at government public car parks (see **para. 2.22**), the Government would also introduce some mid- and long-term measures, which include exploring feasible measures to encourage existing private buildings to build infrastructures for installing EV charging facilities or chargers, and drawing up plans for setting up a smart system for the Government's EV public charging network. The functions of the system would cover instant electronic information about the usage status of charging facilities, fare collection system and management facilities of charging spaces. The Government would also examine the feasibility of advance booking of charging spaces.

(IV) MANAGEMENT OF CHARGING FACILITIES AT GOVERNMENT CAR PARKS

5.23 Given that charging facilities at government car parks are merely supplementary in nature, and under the principle of proper use of car parking resources and equal treatment to users of EVs and other vehicles, the Government has not designated parking spaces equipped with charging facilities to the exclusive use by EVs. The number of complaints in the past four years about charging spaces at government car parks being occupied by non-EVs is shown in **Table 14** under **paragraph 3.10**.

5.24 In support of the above policy, TD, GPA, LCSD, HD and HKHS have implemented complementary measures, as detailed below.

(1) TD

5.25 Government public car parks are built to provide parking spaces for private vehicles, light goods vehicles and motorcycles so that vehicles would not stay on the road unnecessarily, thereby improving the traffic. Under ENB's current policy, public charging facilities are merely supplementary in nature. Given the limited number of parking spaces, and under the principle of proper use of resources and equal treatment to users of different types of vehicles, all parking spaces for private vehicles (with or without charging facilities) at TD's car parks are open to use by all vehicles.

5.26 At present, the utilisation rate of public car parks under TD in general exceeds 85% during peak hours, and is sometimes as high as 96%, reflecting a huge public demand. TD considered that from the perspective of traffic management, any measure restricting the use of the parking spaces would prohibit the full utilisation of car parking resources, and bring about adverse impacts to the traffic condition of all the roads in the vicinity. Thorough consideration before implementation is, therefore, imperative.

5.27 There are altogether 282 parking spaces equipped with charging facilities at the eight public car parks under TD (see **Table 8** under **para. 3.7**). In 2018, each of these charging facilities was only involved in less than 0.07 complaint on average (see **Table 14** under **para. 3.10**). TD considered that the problem of EV drivers failing to find a charging space for their vehicle was not that serious. Notwithstanding this, TD already reminded the operators of public car parks to continue to arrange for traffic cones to be placed at parking spaces equipped with charging facilities during non-peak hours and where practicable, depending on the actual utilisation of the car parks, such that these parking spaces would be reserved for priority use by EVs to charge their batteries. Moreover, TD and the operators analysed from time to time the complaint cases that involving charging spaces. TD also instructed the operators to urge their frontline staff to step up patrols at the car parks.

5.28 TD also pointed out that as the travel pattern of drivers varies, and the utilisation of different car parks during different periods are not the same, so there is no arrangement to rigidly fix a certain period of time as "non-peak hours". Under the principles of optimal utilisation of parking resources and equity for all, however, car park operators would reserve charging spaces for priority use by EVs during non-peak hours.

(2) GPA

5.29 Parking spaces at the government car parks under GPA are mainly for use by other Government departments during office hours. Upon confirmation of the departments' operational need for parking spaces, GPA would arrange to open the remaining parking spaces to public during suitable time periods. The parking spaces designated for public use during the specific time periods are operated and managed by outsourced contractors in accordance with the licence agreements. GPA would comply with ENB/EPD's requirements to follow up with the contractors and complement the reservation policy and measures with regard to charging spaces so that priority could be given to EVs to charge their batteries during non-peak hours and where practicable.

5.30 GPA explained that since utilisation of car parks is fluid, subject to changes in actual demand, the Department does not require that certain periods of time be rigidly designated as "non-peak hours". In general, "non-peak hours" refer to periods during which there are relatively more vacant parking spaces; while "where practicable" means that car park contractors would, in view of the availability of more vacant parking spaces during non-peak hours, reserve some of the charging spaces for priority use by EVs to charge their batteries ("the reservation arrangement"), as per GPA's requirements. Nevertheless, under some circumstances (such as when a charging space is already occupied), the contractors may not be able to implement the reservation arrangement during non-peak hours. As such, the arrangement could only be made "where practicable".

5.31 To raise public awareness about the charging facilities installed at GPA car parks, the Department requires that all car park contractors, in addition to implementing the reservation arrangement, assist in making arrangements to display information or notices about charging facilities at conspicuous places of car parks. Besides, GPA also discusses with EPD the arrangements for putting up green signs or green wall paper designed for EV charging facilities at the charging spaces, so that the information can be more eye-catching.

5.32 Since the installation of EV charging facilities at GPA car parks in 2012, as at the end of 2018, GPA has received 11 complaints about charging spaces being occupied. Given that some 900 parking spaces are open to public use, the problem of non-EVs occupying charging spaces is not serious.

(3) LCSD

5.33 There are now 86 car parks under LCSD management, four of which are providing in total 18 parking spaces equipped with charging facilities for public use (the Tsuen Wan Sports Centre was opened in October 2018). Charging spaces in two of those four car parks were set up in response to EPD's invitation to join a pilot scheme for testing the reliability of outdoor charging facilities.

5.34 Similar to the charging spaces at car parks managed by other Government departments, those at LCSD car parks are not for the exclusive use by EVs. However, they have been designated for "priority use by EVs". Only when all the other parking spaces at a car park have been occupied can non-EVs park at those charging spaces.

5.35 For the car parks in newly constructed venues, LCSD already has plans to install charging facilities and related ancillary facilities in accordance with Chapter 8 of the HKPSG and related internal guidelines of the Government (see **para. 5.17**). It also intends to retrofit the car parks in 53 LCSD venues with more charging facilities. When retro-fittings are completed and new management contracts for the car parks due for tender, new terms and conditions may be included to require more charging spaces at those car parks be made available for use by EPVs.

(4) HKHA/HD

5.36 The 161 car parks currently under HKHA are mainly for use by the residents of HKHA estates/courts and their visitors, and there are in total 132 charging spaces for hourly rental at 18 of these car parks (see **Table 11** under **para. 3.8**). Owing to the limited number of hourly parking spaces at individual car parks, and because there are more non-EV users than EV users, for the optimum use of resources, car park management personnel would allow non-EVs to park at charging spaces during peak hours and when there are no EVs. Besides, HD has not set any time limit by which an EV must leave the parking space after charging is completed. The Department would review from time to time the management and provision of charging spaces according to their actual utilisation.

(5) HKHS

5.37 All parking spaces at HKHS car parks, whether for monthly or hourly rental, are leased out in a floating mode. Parking spaces equipped with charging facilities are

also operated according to relevant arrangements, they are leased out on a first-come-first-served basis to EV owners for use in accordance with relevant instructions, and are not designated for EVs only. Car park management personnel would coordinate with EV owners about the time and duration of use. According to the land leases, most of the HKHS car parks are for the exclusive use by the property owners and their visitors. To date, HKHS has never received any complaints about non-EVs occupying charging spaces.

5.38 HKHS indicated that it would consider installing more charging facilities or upgrading the existing facilities with reference to actual demand. However, the alterations must be in line with the requirements in the land leases and deeds of mutual covenant of the buildings. Technical feasibility must also be evaluated. Regarding the installation of charging facilities in new building developments, HKHS is open to options under the principle of supporting the Government's policy direction as far as possible.

6

OUR COMMENTS AND RECOMMENDATIONS

6.1 At present, many countries/regions are working towards a complete ban on sale of petrol vehicles in order to reduce their number. Norway has announced that the sale of conventional petrol vehicles will be halted in 2025. While the Netherlands has set the time frame at 2030, the United Kingdom, France and Taiwan have decided that they will achieve the same in 2040. In September 2017, Mainland China started to work out a timetable for banning the sale of conventional petrol vehicles.

6.2 In Hong Kong, there is no automobile manufacturing, and all vehicles are imported. Hence, if more countries are banning the sale of petrol vehicles, there will be drastic changes to the market supply of vehicles in Hong Kong. As early as in the 1990s, the Government started promoting the use of EVs, and in its policy documents explicitly supported the implementation of such a policy. Regrettably, the Government subsequently changed its policy direction and measures, and failed to explain clearly the reasons and justifications to make the public understand the Government's stance in promoting the use of EVs.

6.3 Whether the Government should promote the use of EVs over conventional petrol vehicles is not the focus of this direct investigation. Nevertheless, we consider that the policies set by the Government should be clear and precise, and be complemented with practicable measures (including the planning, installation and development of ancillary facilities) and specific targets, so that various stakeholders (such as the two power companies, automotive sector, vehicle owners and car park owners) would be motivated to offer their support.

(I) FAILING TO CLEARLY EXPLAIN TO THE PUBLIC THE CHANGE IN POLICY ON ELECTRIC VEHICLE

6.4 As discussed in **Chapter 2**, it has been the Government's policy to promote the use of EVs. From the 1990s to early 2000, the Government had introduced measures which were in line with the implementation of such policy, in particular repeated extensions of FRT exemption for EVs that led to the rapid growth in the number of EPVs in Hong Kong. Apart from promoting the use of EVs, the Government had mentioned from time to time the importance of infrastructure development. In 2010, the Steering Committee set up a working group to explore ways to increase charging facilities to support the increase in supply of EVs in Hong Kong[10]. In 2011, the Government indicated that it would establish the essential infrastructural support in anticipation of the growth of the EV fleet[11]. In a press release issued in 2012, the Government noted that it was essential to put in place a comprehensive public EV charging network in promoting the use of EVs[12]. It is also stated in Chapter 8 of the HKPSG that "the provision of sufficient charging facilities in both private and public parking is crucial to the adoption and use of EVs".

6.5 To meet these objectives, the Government then introduced a number of measures to expand the EV charging network (see **para. 2.14**), which included increasing the number of charging facilities. In 2014, the ratio of the number of EVs to the number of charging facilities was even close to 1:1 (see **Table 2** under **para. 3.2**). Therefore, members of the public had reasons to believe that the Government was proactively promoting the use of EVs and that more charging facilities would be provided to achieve this purpose.

6.6 In 2016, however, the Government indicated that the major target in its policy was to promote the use of EVs in the public transport system (see **para. 2.17**), and there was no mention of promoting the use of EPVs. An apparent measure was the reduction in the FRT concession for EPVs in 2017 (see **paras. 2.18 and 5.4**), which caused a sharp drop in the growth of EPVs (see **Table 1** under **para. 3.1**). Meanwhile, there was no

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10 See the press release issued on 9 July 2010 entitled "With more supply of electric vehicles, working group formed to strengthen charging infrastructure".

11 See the press release issued on 15 March 2011 entitled "Charging network for electric vehicles expanded to all 18 districts".

12 See the press release issued on 24 May 2012 entitled "1,000 charging stations for electric vehicles to be in place by end of June".

significant increase in the number of charging facilities at government public car parks (see **Table 3** under **para. 3.3**) (see **paras. 6.16-6.22** for details about the inadequacy of public charging facilities at government car parks).

6.7 From 2016 onwards, the Government has conveyed the following messages in its press releases, Government officials' remarks during meetings and its responses to our enquiries regarding the use of EVs and installation of charging facilities:

- Owners of EPVs should charge their EVs by using charging facilities at their workplace, home or other suitable places. The public charging network mainly serves as supplementary charging facilities.
  (The press release issued on 22 June 2016 – LCQ18: Charging facilities for electric vehicles)

- The Government will continue to closely monitor the development of EVs and ensure the timely expansion and enhancement of public charging facilities to meet the need of EV drivers for charging their vehicles during their journey.
  (The press release issued on 14 December 2016 – LCQ3: Measures to promote environmental-friendly vehicles)

- Increase in the number of EPVs has led to significant growth in the overall number of private vehicles. The revised FRT concession helps avoid further worsening of traffic congestion problem which could offset the efforts to improve roadside air quality.
  (The press release issued on 31 May 2017 – LCQ18: Electric vehicles)

- Charging facilities at Government public car parks are supplementary facilities. Currently, there is no need for a significant increase in the provision of such facilities (see **para. 5.16**).
  (Government's reply on 27 November 2017 to our enquiries)

- When drawing up the FRT concessions for EPVs, the Government considered that while refraining from promoting the overall growth of private vehicles causing traffic congestion and aggravating roadside air pollution, such concessions could aptly encourage people to go for EVs when purchasing private vehicles.
  (The press release issued on 12 December 2018 – LCQ4: Promoting

use of electric private cars)

- The Secretary for the Environment admitted that there is room for improvement as regards installation of charging facilities.
(The remarks made by the Secretary for the Environment during the meeting of LegCo's Panel on Environmental Affairs on 28 January 2019)

6.8 As revealed in the above paragraph, Government's message to the public about promoting the use of EVs keeps changing. When the public expected proactive promotion of use of EVs, the Government reduced the FRT concession for EPVs to suppress the growth in the number of private vehicles. Moreover, when ENB referred to the statement "the Government's longer term target is that as far as private cars are concerned, 30% are EVs or hybrid by 2020" in the HKPSG, it explained that the figure merely represents a hypothetical scenario rather than a target. The original "target" has been changed into a "vision" (see **para. 5.3**). Such a change has inevitably given the public an impression that the Government is not as proactive in promoting the use of EPVs as before.

6.9 On installation of charging facilities at Government car parks, the Government has also failed to make itself clear. Initially, the Government indicated that "it was essential to put in place a comprehensive public EV charging network in promoting the use of EVs" (see **para. 6.4**). That would naturally lead the public to expect that the Government would provide comprehensive public charging facilities. Subsequently, the Government, however, changed to say that "owners of EPVs should charge up their EVs by using charging facilities at their workplace, home or other suitable places. The public charging network mainly serves as supplementary charging facilities" (see **para. 2.23**). That was to advise the public to install charging facilities at home or in their workplace, and not to rely on the Government. Moreover, while the Government indicated that there was no need for a significant increase in provision of public charging facilities, the Financial Secretary proposed in the 2019/20 Budget to earmark $120 million for expansion of public EV charging network at Government car parks (see **para.5.22(1)**). That has made the relevant policy and measures look confusing and inconsistent.

6.10 In response to this direct investigation, EPD explained to us that relevant measures were adjusted because of the different paces of development of EPVs and ECVs, and other factors including the market supply. We consider it not unreasonable

for the Government to adjust its policy on promoting the use of EVs where appropriate, and modify relevant measures according to the actual situation. Nevertheless, the public opinions mentioned in **Chapter 4** show that the automotive industry and members of the public seemed not to understand the reasons and justifications behind. They even found the Government's policy self-contradictory, and that the measures adopted were contrary to the policy. Although EPD has reiterated that detailed explanation for the adjustment had been provided (see **para. 5.2**), it is doubtful whether its message was effectively conveyed, and the public fully understood and accepted the Government's explanation. In fact, it is clearly stated in the HKPSG that "the Government's longer term target is that as far as private cars are concerned, 30% are EVs or hybrid by 2020" and "the provision of sufficient charging facilities in both private and public parking is crucial to the adoption and use of EVs". At present, the Government is of the view that the aforesaid "target" is too optimistic (see **para. 5.3**), and that there is no need to put in too much funding for provision of public charging facilities (see **para. 5.11**). As the Government has not yet revised such statements, it is difficult for people to understand Government's policy objective and direction.

6.11 Furthermore, we consider the inadequacy of charging facilities a chicken-and-egg problem. That only a small number of vehicle owners can benefit from the charging facilities is the main reason why many private car parks are reluctant to install such facilities. If the use of EVs is on a rising trend, we believe that more private car park operators (including owners' corporation) will proactively explore the feasibility of installing charging facilities. As the Government is still encouraging members of the public to use EVs if they need to keep private vehicles, it should explain to them in a timely manner when adjusting the focus of its policy and relevant measures. Otherwise, EV owners or those intending to purchase EVs will not understand the changes in measures, and they will not know what to do. Similarly, private car park operators may have reservations about investing in EV charging facilities, which will further hinder the popularity of EVs in Hong Kong.

6.12 The Government had indicated a number of times that it would take the lead to use EVs (see **paras. 2.12(3), 2.16(1) and 2.25(13)**). In recent years, however, the growth in Government's purchase of EVs has slowed down. According to **Table 13** under **paragraph 3.9**, there was a twofold increase in the number of EVs used by the Government from 50 in 2012 to 156 in 2013, when the highest growth was recorded. But then, negative growth was recorded where the number of EVs dropped from 254 in 2017 to 253 in 2018. Meanwhile, the number of petrol vehicles in the government fleet increased by 2.3% from 2,336 in 2017 to 2,389 in 2018.

6.13 We understand that the development of EV technology is a decisive factor in the Government's purchase of EVs. Nevertheless, if the Government encourages the use of EVs, it should set an example by replacing more vehicles in its fleet with EVs where practicable. That would help to convince the public and promote the use of EVs. The Government should consider giving priority to EVs if the market has suitable EV models that meet the operational needs of Government departments. Otherwise, it would be difficult to convince and encourage others to follow suit.

6.14 In our view, promoting the use of EVs in Hong Kong is a long-term policy which requires clear and long-term planning to remove any ambiguity. The Government, therefore, must clearly explain to the public its policy direction and specific targets, and its reasons and justifications for formulating the relevant measures (including the planning and arrangements for ancillary facilities). Where the Government finds it necessary to adjust the policy and modify the measures to keep pace with the actual situation (such as technology development), it should take the initiative to explain to the public the reasons in detail, and inform the parties affected of what can be done in the light of the changes.

(II) INSUFFICIENT CHARGING FACILITIES

6.15 In an opinion survey[13], 85% of the respondents considered that charging facilities for EVs in Hong Kong were inadequate while less than 10% of the respondents were of the view that the availability of charging facilities was "just enough" or "enough". It shows that many people consider the Government's provision of charging facilities inadequate.

(1) Car Parks Managed by Government

6.16 Between 2012 and 2015, the prevailing Government policy was "infrastructure-led" which advocated allocating resources to enhance the public charging network. Nevertheless, **Table 2** under **paragraph 3.2** shows that while the number of EPVs has surged since 2014, there has been no significant increase in the number of public charging facilities. Although EPD has explained that it might not be

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[13] In December 2017, Charged Hong Kong commissioned Public Opinion Programme of the University of Hong Kong to conduct the "Public Opinion Survey on Electric Private Cars" to gauze Hong Kong public's opinion towards EPVs and their views on related tax policies and measures.

necessary for the number of charging facilities to increase at the same pace as that of EPVs (see **para. 5.10**), it can be foreseen that EPV drivers will encounter greater difficulty than before in finding an available public charger for charging their vehicles.

6.17 In recent years, the Government has suggested EV owners to charge their vehicles at their workplace or home instead of public car parks (see **para. 2.23**). However, as stated in **paragraphs 4.10 and 4.13**, parking space owners often encounter substantial resistance when trying to install EV charging facilities at their private parking spaces. Consequently, the public charging network still serves as a major support for charging EPVs, rather than just supplementary in nature. According to our site observations as detailed in **Chapter 4**, some EV owners would regularly charge up their vehicles at government public car parks (see **para. 4.24**).

6.18 While the Government has encouraged EV owners to charge up their vehicles at home, the number of parking spaces equipped with charging facilities at the car parks managed by HKHA and HKHS remains relatively low. Among the 161 car parks under HKHA, only 28 (see **Table 11, para. 3.8**) have been equipped with charging facilities, representing less than 18% of the total number of car parks under HKHA. Among its monthly rental car parks, there are 22 equipped with charging facilities, of which 11 car parks have less than 5% of their parking spaces equipped with charging facilities, and majority of the car parks under HKHA have that ratio at less than 2%. It can be seen that vehicle owners living in public rental housing estates can hardly follow the Government's suggestion of charging up their EPVs at the car parks of their residence. We consider that the Government should set an example in providing more charging spaces in the public housing estates. HKHA can even designate a certain number of parking spaces for EVs, thereby encouraging residents to use EVs.

6.19 Currently, car parks managed by GPA provide parking spaces for some civil servants in their workplace. If the Government intends to encourage its staff to choose EVs, it should consider increasing the number of charging spaces at those car parks. Nevertheless, **Table 9** under **paragraph 3.7** shows that only 15.79% of the total number of parking spaces at GPA car parks have charging facilities.

6.20 **Table 8** under **paragraph 3.7** shows that on average, 7.45% of the parking spaces in the 24-hour public car parks under TD have charging facilities. Such percentage is far lower than that of other government car parks that are not open 24 hours per day to public (car parks under GPA: an average of 15.79%; car parks under LCSD: an average of 15.65%; car parks under HKHA with hourly rental parking spaces:

an average of 15.73%)(see **Tables 9** to **11** under **paras. 3.7 and 3.8**). At present, the authorities have not set any long-term targets for the installation of charging facilities in existing buildings. In the same way as the procurement of EVs, the Government should take the lead in providing EV charging facilities at the car parks under its management, thereby encouraging other public organisations and private buildings to follow suit. In this regard, we are pleased to learn that the Government has earmarked $120 million for installing more than 1,000 medium chargers at government public car parks in the next three years. Upon completion of the installation, the percentage of parking spaces equipped with chargers at government public car parks will increase to 30%.

6.21 Meanwhile, the number of government car parks with charging facilities remains low. LCSD is a case in point. Currently, LCSD has 86 venues with car parks, only 4 of them have been equipped with EV charging facilities (see **para. 5.33**), notwithstanding that the department has proposed to install charging facilities at 53 existing car parks.

6.22 Moreover, as cited in **paragraph 5.8**, one of the reasons for some Government departments being reluctant to procure EVs was that there was no charging facilities at locations of outside duty or workplaces. Evidently, insufficient charging facilities would also dampen the interest of Government departments in using EVs.

(2) Existing Private Buildings

6.23 The Government encourages the installation of charging facilities in private buildings. However, it will need permission from the property owners concerned to install charging facilities at those private car parks. Complicated legal issues might arise due to the restrictions under the land leases or deeds of mutual covenant of the buildings. Moreover, given the concerns of property owners or owners' corporations over the electricity loading, deployment of the building's common resources for the benefit of a minority of EV owners, and inconvenience to other parking space owners during the installation works, owners of parking spaces would have to overcome a number of hurdles before they could install charging facilities at their parking spaces, and the process is often accompanied by lengthy and time-consuming negotiations. This becomes a formidable obstacle for people who want to install charging facilities.

6.24 All along, the Government has been merely issuing letters to encourage private building owners and providing technical guidelines to promote the installation

of charging facilities in private buildings (see **paras. 2.14(3), 5.18** and **5.19**). In the lack of statutory requirements and financial incentives, many owners of existing private buildings are not interested or determined in installing charging facilities, which often involves high cost. In fact, the two power companies were also aware of the substantial difficulties encountered by EV owners when they tried to install charging facilities at their residential buildings (see **para. 4.13**). Apart from those practical issues such as space and cost, whether the building owners or owners' corporations are willing to cooperate is also an issue. The matters cannot simply be resolved by technical support. Some vehicle owners told this Office that they were unable to install chargers at the parking spaces at their residence or workplace due to unsuccessful negotiations with the building owners or owners' corporations (see **para. 4.10**). We consider that the Government has obviously underestimated the resistance to the installation of EV charging facilities at car parks in private buildings. If the Government wants to encourage members of the public to charge their vehicles at home instead of relying on public car parks, it should explore other means to encourage the installation of charging facilities in existing buildings.

(3) Newly Constructed Private Buildings

6.25 There are media reports that the EV charging socket outlets at some newly constructed car parks which had been granted GFA concessions were unable to charge EV. The Government explained that EV technology was still at the development stage in 2011, and the mainstream standards for EV chargers and related installations were not established yet. Therefore, it is stipulated in the Technical Guidelines for Electric Vehicle Charging-enabling for Car Parks of New Building Developments ("Technical Guidelines")[14] that the car parks of new buildings should meet the basic conditions for providing EV charging-enabling infrastructure. They are not required to have EV chargers installed and electricity meter connected at the parking spaces equipped with such infrastructure. The Government currently has no data on the number of charging facilities available at those places and their charging speed[15].

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14 As stipulated in the Technical Guidelines issued by ENB and EMSD, GFA concessions will only be granted to the car parks of new building developments that meet the basic conditions of providing EV charging-enabling infrastructure.

15 See the press release issued on 31 January 2018 entitled "LCQ5: Gross floor area concessions for putting in place electric vehicles charging infrastructure in private car parks".

6.26 At present, EPD has uploaded to its website information about charging facilities available for public use, including their locations, types and numbers[16]. However, the developers of those buildings who have benefited from the concessions are not required to provide EPD with information and statistics about the provision and utilisation of public charging facilities in the buildings concerned. We consider that land is the most precious resource in Hong Kong. After granting GFA concessions, the Government can indeed take a further step by requiring the developers to actively submit the relevant data, which will enable the Government to understand the supply and demand of public charging spaces for effective planning. Nevertheless, such data has not been collected by ENB/EPD in a systematic way. This shows that the authorities are too passive in performing their duties and fail to complement the policy of encouraging members of the public to use EVs and charge their EVs at home or in the workplace.

(III) UNDERESTIMATING THE DEMAND FOR CHARGING FACILITIES

6.27 The Government sees no urgent need to increase the number of charging spaces, because its statistics show that the current utilisation rates of charging facilities at public car parks are still low. However, in our view, this can be due to the fact that charging spaces are often occupied by non-EVs. In fact, ENB/EPD admitted the situation in the meeting of the LegCo Panel on Environmental Affairs on 26 February 2018[17]. This Office, therefore, does not accept the argument of TD and GPA, as cited in **paragraphs 5.27 and 5.32**, that based on the relatively low number of complaints, the problem of charging spaces being occupied by non-EVs was not serious. Our site observations actually revealed that the occupation of charging spaces by non-EVs is very common.

6.28 Besides, the charging spaces in some government public car parks are still equipped with standard chargers (see **Table 3, para. 3.3**). As at December 2018, nearly 90% of the total number of chargers installed at the car parks (some not open to public use) under LCSD, HKHA and HKHS are still standard chargers (see **Table 4**

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16 See EPD website – Locations of Chargers for Public Access: https://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/promotion_ev.html

17 See the discussion paper on measures to promote the use of electric vehicles for the meeting of the LegCo Panel on Environmental Affairs on 26 February 2018.

under **para. 3.3**). Since the charging time of a standard charger is longer than a medium charger[18], this will inevitably lead to a low turnover of charging spaces. EV owners may not even use the standard chargers for charging their vehicles. The overall utilisation rate of chargers at public car parks may become lower as a result.

6.29 In sum, we believe that the data on the utilisation of public EV chargers provided by the Government may not have fully reflected the actual demand for the charging facilities at public car parks, and that the utilisation rate may have been underestimated. Taking into account the latest development of charging technology, ENB and EPD should assist the relevant departments and organisations to upgrade the standard chargers at their car parks to medium or quick chargers.

(IV) INFORMATION SHARING INADEQUATE

6.30 As stated in **paragraph 6.26**, information about charging facilities available for public use is already uploaded to the EPD website, but the Government does not have data on the utilisation of public charging facilities at non-government public car parks. After the commencement of our investigation, the Government indicated that it would start the work (see **para. 5.21**). In fact, collecting data on the utilisation of charging facilities will enable effective analysis and better estimation of the demand and supply of public charging facilities.

6.31 With the advancement of technology, information sharing has become very convenient. At present, there are a number of mobile applications available on the market providing instant information on the use of charging facilities. However, the Government obviously lags behind in the application of information technology and in the setting up of information sharing platform in that regard. In 2017, when replying to a question by a LegCo Member, ENB mentioned that EPD was in the process of installing equipment in the public EV chargers at certain government car parks with a view to providing instant electronic information on the availability of chargers on the government electronic platform for public reference on a trial basis. Subsequently, EPD deferred the estimated completion date of the trial from the end of 2018 to the end

18 According to Chapter 7: Electric Vehicle Charging Facilities in the Guide to Connection of Supply published by HK Electric, for an EV with battery capacity of 18kWh, it generally takes 6 to 7 hours to complete a full charge when using a standard charger, but only 2 to 3 hours when using a 1-phase 32-A medium charger.

of 2019[19]. In other words, it is unlikely that information technology can be applied to improve the efficiency of using public charging facilities in the near future. As regards the smart system set up by the Government for the EV public charging network, it is still in the planning stage (see **para. 5.22(4)**) and the final results are unknown yet. We consider that the Government should expedite its work in this regard.

(V) POOR MANAGEMENT OF CHARGING SPACES AT GOVERNMENT PUBLIC CAR PARKS

(1) Utilisation of Charging Spaces

6.32 According to the public views and our site observations as detailed in **Chapter 4**, EV owners are often inhibited from using the charging facilities at government public car parks due to the following problems:

(1) charging spaces are occupied by non-EVs; and

(2) some EVs continue to occupy the charging spaces after charging is completed.

6.33 The authorities explained that based on the principle of fair and proper deployment of public resources, all parking spaces at government public car parks are open for public use. During non-peak hours, however, charging spaces would be reserved for priority use by EVs where practicable. We understand the rationale behind, but are concerned whether it could be, and has been, effectively implemented.

6.34 We consider that unless some parking spaces are designated for charging purpose only, the management staff will not be able to ensure that charging spaces are available for use by EV owners. As regards the measure of priority use of charging spaces by EVs during non-peak hours, it is difficult to implement in practice because the management staff cannot keep monitoring those charging spaces round-the-clock. If a charging space is already occupied by a non-EV during peak hours, the management staff can hardly ask the vehicle owner to move away the vehicle in non-peak hours.

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19 See the press release issued on 13 December 2017 entitled "LCQ2: Public charging facilities for electric vehicles", and the press release issued on 27 February 2019 entitled "LCQ20: Promoting popularisation of electric vehicles".

6.35 Government departments which have car parks under their management have already asked the car park operators to put traffic cones or signage at charging spaces where practicable to reserve them for priority use by EVs for charging purposes. Nevertheless, parking spaces are tight in supply and car park management staff simply cannot keep a watch of the charging spaces all the time. Non-EV drivers can just move away the traffic cones or signage and park their vehicles at charging spaces. This was also what we witnessed during site observations (see **para. 4.28**).

6.36 In fact, there are no clear-cut and fixed "non-peak hours" at government public car parks during which EVs have priority use of the charging spaces (see **paras. 5.28 and 5.30**). The arrangement for reserving charging spaces for priority use by EVs is not a statutory requirement and is implemented largely on a voluntary basis by outsourced car park operators. Lax monitoring also rendered full and effective implementation impossible.

6.37 Another reason for the difficult implementation of the measure of "priority use by EVs" is the proximity of most existing charging spaces to the entrance/exit of car parks (as in the case of the Rumsey Street Car Park). The convenient location makes these parking spaces so popular that car park operators may have even greater difficulty in reserving them for EVs. During site observations, we found that even when there were other vacant parking spaces at a car park, those charging spaces were still occupied by non-EVs.

6.38 We consider that for the better management and higher efficacy of charging facilities at car parks in the long run, the Government needs to introduce a smart system for the EV public charging network (see **para. 5.22 (4)**). Meanwhile, it should explore other measures in the short-to-medium run to alleviate the problem of charging spaces being occupied by non-EVs and those EVs that are not charging. For instance, the Government can examine how to enhance the existing "reservation arrangement" for EVs, and consider formulating clearer guidelines. It can also consider installing additional charging facilities at parking spaces further away from the entrance/exit of government car parks. In the long run, the Government can study the feasibility of imposing a higher fee on those vehicle owners who occupy a charging space not for the purpose of charging their vehicles.

(2) Repair and Maintenance of Charging Facilities

6.39 Besides the persistent problem of charging spaces being occupied by non-EVs, some people also complained to us about the frequent breakdowns of the charging facilities at government car parks (see **para. 4.19**). This Office is of the view that even though the Government has installed more and better charging facilities, frequent breakdowns would render the facilities useless and result in a waste of resources. As such, the authorities must urge the car park operators to strengthen their monitoring, repair and maintenance of charging facilities. Upon discovery of problems or receipt of relevant public enquiries and complaints, their staff must promptly refer the case to the relevant department or organisation for follow up.

6.40 EPD's information showed that the Government had upgraded 100 and 174 standard chargers to medium chargers in 2014 and 2017 respectively. Another 96 chargers were also scheduled for upgrading to medium chargers by April 2018. The total expenses incurred in these upgrading projects were around $11.4 million. Given the resources already invested by the Government in installing more and better charging facilities, we consider it unsatisfactory, from the perspective of proper use of public resources, that those facilities could not be fully utilised because of the failure to implement the "priority use by EVs" arrangement at government car parks (see **paras. 6.34-6.38**) and the poor repair and maintenance of charging facilities (see **para. 6.39**).

(VI) ABSENCE OF A CLEAR FEE-CHARGING POLICY FOR ELECTRIC VEHICLE CHARGING SERVICE

6.41 Free charging service is an incentive for people to buy EVs. In 2013, the Government conducted a survey, led by EPD with the assistance of GLD, on the performance of the saloon cars and motorcycles in its fleet. It was found that EVs can save up to 80% in terms of electricity/fuel costs[20]. In view of the growth in the number of EVs, the utilisation of charging facilities and the financial implications, the Government has since been providing free use of the public charging facilities installed by EPD at the car parks under TD and GPA. EPD's information showed that the electricity bills for those charging facilities amounted to around $0.9 million and $1 million in 2017 and 2018 respectively, all borne by the Government.

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[20] In comparison with petrol vehicles subject to the duty on petrol.

6.42 With the growing popularity of EVs, however, some EV manufacturers have taken the lead in charging a fee at their charging points, and a number of shopping centres already introduced EV charging service at a fee. The two power companies also announced that free charging service at their EV charging points will only be extended until 31 December 2019 (see **para. 4.12**). All the various signs indicate that EV charging service is gradually heading for the "user pays" mode. Although the Government is still providing free EV charging service at its car parks (see **para. 2.25 (4)**), the smart system for the EV public charging network under examination already includes a fee-charging function (see **para. 5.22 (4)**), reflecting the Government's intention in the long run to charge a fee for the public charging service at its car parks. Nevertheless, the Government has never announced when the free charging service will cease and the subsequent arrangements. We consider that no matter the charging service is provided free or not, and when it intends to start charging a fee, the Government should properly manage expectations and let the public know the related arrangements as soon as possible. It should also formulate clear EV fee-charging policies.

(VII) LACK OF OTHER LONG-TERM SUPPORT MEASURES

(1) Training for EV Mechanics

6.43 Unlike the repairs of petrol vehicles, that of EVs largely involves electrical installations. The professional knowledge required for the repair and maintenance of EVs, therefore, falls outside the expertise of most car mechanics. This is why at present, EV owners mainly rely on the repairs and maintenance service provided by the EV manufacturers. Nevertheless, with the growing popularity of EVs, demand for EV maintenance service would become greater. The huge demand can hardly be met if such dependence continues.

6.44 If the Government wants the use of EVs to continue and sustain, then support and training for EV mechanics are indispensable. The Vocational Training Council now offers training courses for EV mechanics, but it is essential to have the EV suppliers sharing information about the maintenance techniques of different brands of EVs with the EV maintenance profession. We consider that training for EV mechanics cannot rely solely on the maintenance profession or the initiative of the tertiary and vocational training institutions. The Government should be more proactive in offering assistance, and encourage the maintenance profession and the relevant institutions to provide

systematic training for those already in the profession, so that their standard and qualification can be raised.

6.45 Furthermore, EVs as a category is not included under the voluntary registration schemes for vehicle mechanics and vehicle maintenance workshops introduced by the Government. With the rapid development of EVs, the authorities should review the current guidelines and update the relevant codes of practice for the trade's reference.

(2) Treatment for Retired Batteries

6.46 Some experts pointed out that EV batteries normally have a lifespan of seven years. With the growing popularity of EVs, the number of retired batteries is expected to increase (see **para. 4.20**). Abandoned EV batteries are chemical wastes, improper disposal of which would have grave implications for the environment[21]. EPD had launched an "International Competition on Second Life for Retired Batteries from Electric Vehicles" in August 2016 to invite practicable and viable ideas from the public for reusing retired EV batteries, yet the Government subsequently failed to introduce any specific proposals or measures to directly regulate or instruct on the handling of retired batteries.

6.47 The Government's efforts on promoting the use of EVs to reduce emissions must be coupled with proper planning for the recycling of retired EV batteries. In addition to formulating strict measures to regulate the disposal of waste batteries, the authorities should make reference to overseas experience in promoting the recycling, processing and reuse of EV batteries, and keep communicating with the relevant sectors and battery suppliers in order to draw up a clear proposal on the collection and handling of abandoned EV batteries to prevent pollution.

OVERALL COMMENTS

6.48 We must stress again that the focus of this direct investigation is not whether the Government should promote the replacement of conventional petrol vehicles with EVs. Our view is that the Government should have a clear policy objective and

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[21] Waste EV batteries are chemical wastes and must be disposed of in accordance with the Waste Disposal Ordinance. At present, most EV manufacturers have engaged licensed collectors to handle their own brand of waste EV batteries by exporting them to Japan, Korea or Belgium for disposal or recycling and reuse after preliminary processing.

planning so that it can formulate measures in line with its policy objectives and direction. Even if the measures have changed with the advancements in technology, the Government should explain clearly to the public so that they can better understand the situation. If the Government hopes that members of the public can change the habit of using petrol vehicles, it should set an example by actively promoting the use of EVs among Government departments and provide sufficient ancillary facilities so that the public and private organisations would be motivated to offer support.

RECOMMENDATIONS

6.49 In the light of the above, The Ombudsman makes the following recommendations to **ENB and EPD**:

Policy Implementation

(1) to explain more to the public the reasons and justifications behind any adjustments to the measures and arrangements regarding the policy on the promotion of EVs (see **para. 6.14**);

(2) to review as soon as possible the contents relating to EV charging facilities in the HKPSG, and make corresponding amendments and updates to match the Government's current policy direction and targets (see **para. 6.10**); and

(3) to set an example by actively promoting the use of EVs among Government departments, and keep watch on the development of EVs. If certain types and models of EVs are found suitable, it should first consider purchasing EVs to replace those vehicles due for replacement (see **para. 6.13**).

Ancillary Charging Facilities

6.50 As the Government has explicitly encouraged members of the public to buy EVs (see **paras. 5.1 and 5.2**), it should provide adequate ancillary facilities. In this connection, we recommend that **ENB and EPD** should:

(4) consider installing more charging facilities at car parks managed by Government departments and public organisations (such as HKHA/HKHS/GPA) in order to support the Government's current policy of encouraging EV owners to charge their vehicles mainly at their homes and workplaces (see **paras. 6.18 and 6.19**);

(5) coordinate and assist other Government departments and public organisations in enhancing the efficiency of the charging facilities under their management (see **para. 6.29**);

(6) install more charging facilities at government public car parks (see **paras. 6.20**);

(7) start collecting data on the utilisation of public charging facilities at non-government car parks as soon as possible for assessing the need for and scale of expansion of public charging facilities (see **para. 6.30**);

(8) discuss with TD and GPA, the departments that manage government public car parks, ways to improve the management of charging spaces. This should include a review on how to enhance the current measure of "priority use of charging space by EVs" and arrangements for setting up new charging facilities at locations further away from the entrances/exits and passageways of car parks (see **para. 6.38**);

(9) expedite the setting up of a smart system for the public EV charging network (see **para. 6.31**);

(10) formulate a clear fee-charging policy on EV charging service and announce the arrangements as soon as possible (see **para. 6.42**);

Support Measures

(11) strengthen liaison with owners' corporations and owners' committees of private buildings. In addition to providing technical assistance, it should also explore other means to encourage existing buildings to install charging facilities (see **para. 6.24**);

(12) review the arrangements for granting GFA concessions to the car parks of newly constructed buildings, and to update the Technical Guidelines (see **para. 6.25**);

(13) collect data on the charging facilities in newly constructed buildings and the charging speed of the facilities (see **para. 6.26**);

Long-term Planning

(14) urge relevant institutions to step up training for EV mechanics and repair technicians for charging facilities, as well as review the current guidelines and update the relevant codes of practice (see **paras. 6.44 and 6.45**); and

(15) discuss with the trade and EV suppliers the issues relating to the proper recycling and disposal of retired EV batteries (see **para. 6.47**).

ACKNOWLEDGEMENTS

6.51 The Ombudsman thanks ENB, EPD, TD, GPA, GLD, LCSD, HD and HKHS for their full cooperation during the course of this investigation. We would also like to express our gratitude to HK Electric, CLP, HKPC and members of the public who have provided valuable information and offered their views on this direct investigation.

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